

THE PREVALENCE OF
RHEUMATIC HEART DISEASE



IN A RURAL POPULATION
CATERED BY RURAL HEALTH CUM
TRAINING CENTRE, MANDUR
AND ADMINISTRATION OF
SECONDARY PROPHYLAXIS

Dissertation submitted for the
DPH (DIPLOMA IN PUBLIC HEALTH)
EXAMINATION

GOA UNIVERSITY

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INTRODUCTION

INTRODUCTION

Rheumatic fever, a clinical syndrome, is an acute inflammatory disease, the chief manifestations of which are arthritis, carditis, subcutaneous nodules, erythema marginatum and chorea. Although it is not a communicable disease it results from a communicable disease i.e. streptococcal pharyngitis. The importance of this disease centres around the fact that it produces heart disease which can be fatal during the acute stage or can lead to crippling chronic heart disease. "Rheumatic fever licks the joints and bites the heart".

The most striking observation regarding rheumatic fever in the last few decades has been the decrease in its incidence in the developed countries and its persistence in the developing countries. Rheumatic fever and rheumatic heart disease were widespread in Europe at the turn of the century, then began to decline. The best information came from Denmark, where rheumatic fever has been notifiable since 1878. Between 1862 and 1900, the annual incidence of rheumatic fever was over 200 per lakh population, but by 1948 it had fallen to about 55 per lakh. The decline subsequently accelerated and by 1962, the incidence was just over 10 per lakh population. Today the mean annual incidence of rheumatic fever in the affluent countries is less than 5 per lakh and is still falling (TRS No. 764).

By the late 1940s, it was evident that rheumatic fever was a significant problem in tropical countries, annual incidence rates ranging from 27 to 100 per 1,00,000 have been recorded in some Eastern Mediterranean Countries (H.A. Majeed et al; unpublished data). Similar rates have been reported from countries in the Western Pacific; for example the annual incidence in Maoris under 20 years of age in Northland, New Zealand is 116/1,00,000. Among socially and economically disadvantaged populations with overcrowded living conditions in developing countries, the incidence is likely to approach 100/1,00,000 in children. The prevalence of rheumatic heart disease among school children in the affluent countries has been reported as 0.6/1000 in U.S.A. and 0.7/1000 in Japan. The decrease in rheumatic fever in these countries started long before sulfonamide and penicillin were used. This decrease has been attributed to improved socio-economic conditions and general living standards. Rheumatic fever/rheumatic heart disease is the most important cause of cardiac death below the age of 45 years in Mongolia, the Phillipines, Indonesia, the Pacific islands, India, Burma, Sri Lanka, Pakistan and the Middle East. The available information suggests that incidence rates of rheumatic fever approaching 100/1 lakh in younger age groups are to be expected in most developing countries. However, even in societies with a high average income, there remain islands of

poverty where a relatively high incidence of rheumatic fever may persist, rendering the 'eradication of rheumatic fever an unfulfilled hope'. (Markowitz 1970).

Historical data: Yearly 30-40% of the patients seen in cardiac clinics in major hospitals are cases of rheumatic fever/rheumatic heart disease (Padmavati 1985). The British military physician in India before the World War II mostly remarked on the rarity of rheumatic heart disease and rheumatic fever in the wards and at autopsies although differences of opinion existed. In 1938, however, Stott the first person to study the problem of rheumatic heart disease in India seriously observed that the extent of the problem was identical in India and London. From 1935 to 1949 reports in Indian Journal pointed to the high prevalence of rheumatic heart disease in all states of the Union. It is possible that urban migration around this period with the creation of slums, overcrowding and cross-infection contributed to this situation.

The link between Group A B-haemolytic streptococcal upper respiratory infection and the subsequent development of rheumatic fever is well established. The disease is typically associated with poverty and especially with poor housing and overcrowding, which favour the spread of streptococcal upper respiratory infection.

Earlier rheumatic fever was considered to be the disease of temperate climates, however a number of reports have shown that it is present rather in high frequency in tropical countries (WHO chronicle 1980). As Shaper (1972) summarises the problem 'tropical in this context pertains less to climate per se than the ecology of rheumatic fever including poverty, overcrowding and grossly inadequate health services.

The only way to achieve a real breakthrough is to combat the root cause of the disease in the population, a matter for public health action.

Although attacks of rheumatic fever can be treated even the best treatment has no effect on the subsequent development and course of rheumatic heart disease. The prevention of rheumatic fever is the only solution. The evidence is very strong that adequate treatment of streptococcal throat infection does prevent the occurrence of rheumatic fever. Widespread improvements in socio-economic conditions will eventually help to diminish poverty related disease i.e. rheumatic fever/rheumatic heart disease, but few developing countries can expect the incidence to decline significantly for this reason.

Goa and its surrounding areas on the West Coast of India have a tropical climate and a certain degree of socio-economic

development. In 1980 Souza et al, studying 14,592 children of school-going age found the prevalence of rheumatic heart disease in Goa to be 1.3/1000.

With much research done on rheumatic fever and its relationship to rheumatic heart disease, it still remains as serious a public health problem. In this country, it is important to unravel the social factors and differences in the health outcome responsible for rheumatic fever and rheumatic heart disease in various social settings. Since socio-economic factors and overcrowding play an important role and are widely responsible for the magnitude of the problem, this study was thought to be essential to add to the current knowledge of the socio-economic factors in rheumatic fever/rheumatic heart disease in a rural area and compare with other Indian states.

The present study is conducted with the aim of studying the prevalence of rheumatic fever and rheumatic heart disease in the area catered to by the Rural Health cum Training Centre, Mandur, and its five sub-centres and administer secondary prophylaxis. This will help in implementing an effective prevention programme in the near future.

AIMS & OBJECTIVES

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- 2.1 To study the prevalence of rheumatic fever and rheumatic heart disease in a rural population.
- 2.2 To administer secondary penicillin prophylaxis.
- 2.3 To study the social factors associated with rheumatic heart disease.
- 2.4 To suggest preventive and control measures to the population so that rheumatic fever/rheumatic heart disease will cease to be a public health problem.

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* REVIEW OF LITERATURE *

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REVIEW OF LITERATURE

3.1 History

Though acute rheumatic fever was apparently known to the ancient Greeks, it was many centuries before it became clearly separated from other forms of rheumatism. Sydenham whose name is associated with chorea, also described the pattern of the migratory arthritis, but the association of the two manifestations were first recognised by Stoll a century later in 1780. Shortly thereafter, Pitcain, Jenner and Wells emphasized that rheumatic fever can damage the heart.

Another century passed before the French paediatrician, Roger recognised the relation of the various manifestations of the disease and Cheadle in 1889 printed out the variations in the clinical patterns at different ages as well as the tendency of the disease to occur in families. Although earlier observers had described submiliary nodular reactions in the myocardium, Aschoff in 1904 is generally credited with stressing their specificity. The criteria introduced by Jones in 1944 brought order into the clinical classification.

The association of acute rheumatic fever with sore throat and the concept of a latent period were recognised during the 19th century, particularly by Haygarth, Froiler and Haig Brown. The relation of scarlet fever and streptococcal tonsillitis to

REVIEW OF LITERATURE

1.1 History

Through early recorded history and prehistory, the history of the human mind has been a subject of interest to many cultures. In the ancient world, the history of the human mind was often seen in terms of the development of the individual. In the Middle Ages, the history of the human mind was often seen in terms of the development of the individual. In the modern world, the history of the human mind is often seen in terms of the development of the individual. The history of the human mind is a subject of interest to many cultures. In the ancient world, the history of the human mind was often seen in terms of the development of the individual. In the Middle Ages, the history of the human mind was often seen in terms of the development of the individual. In the modern world, the history of the human mind is often seen in terms of the development of the individual.

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acute rheumatic fever was described by Schlesinger, Collis and Coburn in 1930 and 1931⁽⁷³⁾, the description of the Anti-streptolysin - O - test by Todd 1932, has permitted correlation of serologic with clinical, epidemiologic and bacteriologic findings.

Treatment of acute streptococcal infection with penicillin was first shown to reduce recurrent attacks of rheumatic fever by Massel and colleagues in 1951 and to prevent the initial attacks by Rammelkamp and coworkers in 1952.

Dillon HL Jr. has proved a disturbing trend of increasing numbers of clinical relapses or recurrent infections has with penicillin, according to him, alternative antibiotics such as oral cephalosporins may now be superior to oral penicillin in terms of lessening the risk of relapse.

3.2 Rheumatic fever:

Rheumatic fever is a multisystem disease the acute manifestations of which may include arthritis and fever, carditis, emotional liability and choreiform movements and less frequently, a characteristic rash (erythema marginatum) and subcutaneous nodules. Rheumatic fever may properly be considered as a complication of streptococcal infection of the upper respiratory tract which includes pharyngitis, tonsillitis, otitis media and scarlet fever.

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The incidence of streptococcal infection obviously varies a great deal, depending on geography, age group, economic status. The incidence of rheumatic fever after known streptococcal infection has been estimated to be about 3% in epidemic situations and 0.3% in non-epidemic situations.

3.3 Prevalence:

Population surveys indicate prevalence rate of rheumatic heart disease varying from 0.15% - 0.31% in different parts of the country (WHO 1980) except in cold hilly areas where it is higher (3.96%) as found by Agarwal (1975)⁽³¹⁾.

Overall prevalence of rheumatic Heart disease was 0.135% in school children in a rural community of a hill region of Nepal and no case of acute rheumatic fever was identified⁽⁷¹⁾.

In a study conducted by Kassam AS and Zaher SR in Ethiopia out of 816 children with history of streptococcal infection 24 developed acute rheumatic fever, 44 had chronic rheumatic heart disease⁽⁷⁸⁾.

A WHO programme for screening of school children (1986-90) gave a prevalence of 0.22% recently identified or already known cases⁽⁸⁵⁾.

In a study conducted in rural Australian aboriginal community by Brenann RE and Patel MS the point prevalence for

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rheumatic heart disease in 1987 was 0.79% in rural Australia and 1.23% according to official population census. These rates are similar to those reported for third world countries⁽⁸⁵⁾.

Eissenberg M.S. has noted that some parts of the developing world have recorded prevalence rates of 1.86%⁽²³⁾.

Out of total 1,433,710 school children who were screened 3135 cases of rheumatic fever were found giving a prevalence of 0.22% which were higher in the African and Eastern Mediterranean region. The countries with the highest prevalence rates were Zambia 12.6%, Sudan 10.2%, Bolivia 17.9% and Egypt 5.19%⁽⁸⁵⁾.

3.4 Age:

Age is a definite factor in the development of rheumatic fever, rheumatic fever like streptococcal infection occurs most commonly in children between 5 - 15 yrs of age with a peak incidence of first attack at 6 - 8 years of age. Of 1926 attacks of rheumatic fever in children, Rosenthal et al in 1968 found only 10 patients less than 3 yrs old, in 3 of these the onset of the disease had occurred before the age of 2 years⁽³³⁾. Deneholz and Rambar (1941) reported a case in a 10 day old infant⁽¹⁸⁾.

The rarity of rheumatic fever in infants under 3 years of age and in older adults is probably attributable to the rarity of streptococcal infections at these extremes. Adults who have

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intimate and frequent exposure to streptococcal infection as in military service or through close contact with school age children increases with increased risk of rheumatic fever. All India Collaborative study from 1972 to 1975 of children 5-16 years of age showed an extremely high prevalence of 0.56%⁽⁴⁵⁾.

According to Padmavati, the 10-14 year age group is more affected than 6-9 years age group as shown in school surveys and prophylaxis programmes⁽⁵⁶⁾.

In a study conducted by D.G. Benekappe et al 5.7% rheumatic heart disease patients were in the age group of 7-12 yrs⁽⁷⁾ similar observations were made by Vaishnava⁽⁷⁹⁾ and Ghosh and Mangat⁽³²⁾ and Mundo RD et al⁽⁴⁶⁾.

In Grover's study in rural Northern India the prevalence was 0.08% while in 5 - 15 year olds it was 0.21%⁽³⁰⁾.

A study in S. Paulo gave a figure of 0.18% in school age population and in adult population in Rio the prevalence rate was 0.77%⁽²⁾.

Prevalence of rheumatic heart disease among school children in India was 0.6% with wide regional variations 1.11% in Delhi as 43 % of the Indian population is under 14 years. There could be some 6 million children with rheumatic heart disease⁽⁵⁶⁾.

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In Senegal Koate observed that 93% occurred in 5-10 year age group 41.9% in 11-20 year old age group there by noting the high number of juvenile cases. In Europe 0-3 year cases were among 6 - 7 year olds and 17.4% in 6 - 11 year old almost equal to USA which was 17% in 6 - 17 year olds⁽⁴¹⁾.

Rheumatic heart disease in Western Kenya gave a prevalence of 0.17% all occurring in age group 10 - 15 yrs⁽⁴⁾.

In a study by Alain Ekne and Edmond Bertrand in Abidjan the average age of sufferers is 21 years while in Quegad region it is 27 years⁽³⁾.

The prevalence rate in Egypt in 1972 in the age group 6 - 12 yrs was 0.1%. In India in 1978 in school children it varied from 0.6-1.1%, in Japan in 1971 in age group 6 - 15 year was 0.019%⁽⁶⁶⁾.

Mortality data reveal an interesting fact that in 1968 the age group (15-24) rheumatic fever with rheumatic heart disease of youth was the leading cause of death in 6 countries⁽⁶⁶⁾.

In a study in Tehran the age specific rates showed a higher incidence in the 5-19 year age group reaching about 0.8/1000⁽⁶⁴⁾.

Various studies show that although rheumatic fever occurs

The first part of the paper is devoted to the study of the properties of the function $f(x)$ defined by the equation $f(x) = \sum_{n=0}^{\infty} \frac{x^n}{n!}$. It is shown that $f(x)$ is a continuous function and that it satisfies the differential equation $f'(x) = f(x)$. The second part of the paper is devoted to the study of the function $g(x)$ defined by the equation $g(x) = \sum_{n=0}^{\infty} \frac{x^n}{n!} \cos \frac{x}{2^n}$. It is shown that $g(x)$ is a continuous function and that it satisfies the differential equation $g'(x) = g(x) \cos \frac{x}{2}$.

The third part of the paper is devoted to the study of the function $h(x)$ defined by the equation $h(x) = \sum_{n=0}^{\infty} \frac{x^n}{n!} \sin \frac{x}{2^n}$. It is shown that $h(x)$ is a continuous function and that it satisfies the differential equation $h'(x) = h(x) \sin \frac{x}{2}$. The fourth part of the paper is devoted to the study of the function $k(x)$ defined by the equation $k(x) = \sum_{n=0}^{\infty} \frac{x^n}{n!} \cos \frac{x}{2^n} \sin \frac{x}{2^n}$. It is shown that $k(x)$ is a continuous function and that it satisfies the differential equation $k'(x) = k(x) \sin \frac{x}{2}$.

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The seventh part of the paper is devoted to the study of the function $n(x)$ defined by the equation $n(x) = \sum_{n=0}^{\infty} \frac{x^n}{n!} \sin \frac{x}{2^n} \cos \frac{x}{2^n} \sin \frac{x}{2^n} \cos \frac{x}{2^n}$. It is shown that $n(x)$ is a continuous function and that it satisfies the differential equation $n'(x) = n(x) \cos \frac{x}{2}$. The eighth part of the paper is devoted to the study of the function $o(x)$ defined by the equation $o(x) = \sum_{n=0}^{\infty} \frac{x^n}{n!} \cos \frac{x}{2^n} \sin \frac{x}{2^n} \cos \frac{x}{2^n} \sin \frac{x}{2^n} \cos \frac{x}{2^n}$. It is shown that $o(x)$ is a continuous function and that it satisfies the differential equation $o'(x) = o(x) \sin \frac{x}{2}$.

The ninth part of the paper is devoted to the study of the function $p(x)$ defined by the equation $p(x) = \sum_{n=0}^{\infty} \frac{x^n}{n!} \sin \frac{x}{2^n} \cos \frac{x}{2^n} \sin \frac{x}{2^n} \cos \frac{x}{2^n} \sin \frac{x}{2^n} \cos \frac{x}{2^n}$. It is shown that $p(x)$ is a continuous function and that it satisfies the differential equation $p'(x) = p(x) \cos \frac{x}{2}$. The tenth part of the paper is devoted to the study of the function $q(x)$ defined by the equation $q(x) = \sum_{n=0}^{\infty} \frac{x^n}{n!} \cos \frac{x}{2^n} \sin \frac{x}{2^n} \cos \frac{x}{2^n} \sin \frac{x}{2^n} \cos \frac{x}{2^n} \sin \frac{x}{2^n} \cos \frac{x}{2^n}$. It is shown that $q(x)$ is a continuous function and that it satisfies the differential equation $q'(x) = q(x) \sin \frac{x}{2}$.

early in India (between 3 - 5 years) initially repeated attacks perhaps because of lack of prophylaxis, make the valvular lesions detectable between 12 - 16 years of age when the maximum prevalence occurs⁽⁵⁷⁾.

3.5 Sex:

There is no striking sex difference in the overall incidence of rheumatic fever but chorea and mitral disease are more common in females, aortic valvular disease is more common in males.

In India: males are more affected than females in Delhi, females more in Kerala where as both sexes equally affected in mid India⁽⁵⁶⁾.

Keith et al has expressed almost equal sex distribution⁽³⁷⁾ Male preponderance was noted by Ghosh and Mangat⁽³²⁾ and Saxena et al⁽⁷⁰⁾.

Male : Female ratio in acute rheumatic fever was 1:1.4 in a study carried out among Ethiopian children⁽⁷⁸⁾.

In a study in Tehran, males and females were equally affected⁽⁶⁴⁾.

In a study in Mongolia there was definite predominance of females in the age range 10-30 years⁽¹⁹⁾.

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3.6 Socio-economic Status:

Socio-economic conditions influence the development of the disease. Poor housing, crowding, poor diet, - poverty, in short, predispose to rheumatic fever - it occurs with greater frequency, crowding due to socio-economic factors or to military exigencies seems to play an important role in the spread of streptococcal infection and in the incidence of acute rheumatic fever. Standard of living seems to be a determining factor in rheumatic heart disease as well as in rheumatic fever⁽⁵⁶⁾ (Padmavati 1978).

Although no single environmental factor has been identified, but the waning of incidence is attributed to improvement of socio-economic conditions, alleviation of overcrowding, improved nutrition and development of physical and environmental barriers to the spread of streptococci⁽³⁹⁾.

The decline in the morbidity of rheumatic heart disease preceeded the development of antimicrobial therapy and has been attributed to rise in the standard of living and accomodation as proved by Agarwal (1981)⁽¹⁾.

In a study by D.G. Benekappe et al 87% of the rheumatic heart disease cases belonged to low and middle income group⁽⁷⁾.

Difference in the socio-economic standards of living remains an important explanation for the difference in incidence

of rheumatic fever in Egyptian children compared with American children⁽³⁸⁾.

Bhave S.Y. Sane S et al noticed that the point prevalence of rheumatic heart disease was estimated to be 0.7% in the lower socio-economic group and 0.05% in the upper⁽¹²⁾.

The incidence of rheumatic fever in socially and economically disadvantaged population is likely to approach 100/100,000 in children. The disease is typically associated with poverty and especially with poor housing and overcrowding⁽⁸⁶⁾.

3.7 Literacy:

Peculiar predisposition for females to rheumatic heart disease could be because of lesser health consciousness among women fear in the adverse effects on the prospects of marriage and reluctance to be examined by male doctors. In Egypt (Eisse et al (1970) it could be due to poor hospital utilisation by females, a reflection of illiteracy⁽⁶⁶⁾.

3.8 Religion:

In a review of 100 cases of rheumatic fever in children by D.G Benekappe et al 84% of cases were Hindus, 15% Muslims and 1% were Christians⁽⁷⁾.

3.9 Overcrowding:

Rheumatic fever rates are higher in blacks than in whites primarily due to increased crowding in these groups (Gordis, Leon 1980)⁽³¹⁾.

Rheumatic fever and rheumatic heart disease are a public health problem where poverty, overcrowding, inadequate ventilation and unhygienic conditions are commonly seen (Park 13th edition⁽⁵⁹⁾, Strasser in 1973 had also reported similar findings⁽⁶⁸⁾).

P.M.Nair and E. Phillip et al reported in their study that only 47% gave a definite history of overcrowding at home⁽⁵³⁾.

The majority of affected population in New York (1969-1988) were from the low income and crowded communities⁽²⁹⁾.

3.10 Occupation:

The prevalence rate of rheumatic heart disease in Pan-Yu country among farmers in China was 0.25% in males and 0.29% among females⁽⁹⁰⁾.

Benekappe et al reported that 50% of patients were unskilled, 41% semi-skilled and 6% skilled, 3% among semi-professional⁽⁷⁾.

Overcrowding

Overcrowding is a major factor in the spread of infectious diseases. It is often found in slums and tenements where many people live in small, poorly ventilated spaces.

Overcrowding is a problem in many parts of the world, particularly in developing countries. It is often found in slums and tenements where many people live in small, poorly ventilated spaces. Overcrowding is a major factor in the spread of infectious diseases. It is often found in slums and tenements where many people live in small, poorly ventilated spaces.

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Occupational

Occupational diseases are those that are caused by the work environment. They can be caused by physical factors such as noise, vibration, and heavy lifting, or by chemical factors such as dust, fumes, and gases.

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3.11 Clinical Manifestations:

Since rheumatic fever is considered to be a specific host reaction to invasion by the group A beta haemolytic streptococci, it can be easily seen, that the clinical picture, depending on the host will be protean indeed.

The symptoms of rheumatic fever usually develop after a latent period of 1 - 5 weeks. Only about 50% of children having rheumatic fever gave a history of a sorethroat 10 - 14 days prior P.M. Nair and E. Phillips et al reported that 10% of children were less than 5 years of age stressing early onset in tropics⁽³⁸⁾.

3.12.1 Major Manifestations:

Jones in a historic paparin 1944⁽³⁶⁾ suggested definite diagnostic criteria for rheumatic fever. He divided the clinical syndrome into two groups, major and minor manifestations. The major manifestations were carditis, chorea, subcutaneous nodules and previous attacks of rheumatic fever. The minor manifestations were fever, abdominal pain, precordial pain, rashes, epistaxis, pulmonary changes, anaemia and high sedimentation rate, later an elevated anti-streptolysin O-titre was also added to the list. More recently a Committee of American Heart Association (1956) modified these criteria which were further revised in 1982 (TRS 764)⁽⁸⁸⁾.

1.1 Clinical Manifestations

Since numerous cases in children have been reported, it is important to consider the possibility of a similar disease in the adult population. The clinical manifestations of the disease are as follows: (1) a prodromal period of 1-2 weeks, (2) a period of 2-3 weeks of fever, (3) a period of 2-3 weeks of headache, (4) a period of 2-3 weeks of joint pain, (5) a period of 2-3 weeks of skin rash, (6) a period of 2-3 weeks of lymphadenopathy, (7) a period of 2-3 weeks of splenomegaly, (8) a period of 2-3 weeks of hepatomegaly, (9) a period of 2-3 weeks of leukopenia, (10) a period of 2-3 weeks of thrombocytopenia, (11) a period of 2-3 weeks of anemia, (12) a period of 2-3 weeks of renal dysfunction, (13) a period of 2-3 weeks of neurological dysfunction, (14) a period of 2-3 weeks of cardiac dysfunction, (15) a period of 2-3 weeks of pulmonary dysfunction, (16) a period of 2-3 weeks of gastrointestinal dysfunction, (17) a period of 2-3 weeks of genitourinary dysfunction, (18) a period of 2-3 weeks of endocrine dysfunction, (19) a period of 2-3 weeks of immunological dysfunction, (20) a period of 2-3 weeks of hematological dysfunction, (21) a period of 2-3 weeks of oncological dysfunction, (22) a period of 2-3 weeks of infectious dysfunction, (23) a period of 2-3 weeks of autoimmune dysfunction, (24) a period of 2-3 weeks of neoplastic dysfunction, (25) a period of 2-3 weeks of degenerative dysfunction, (26) a period of 2-3 weeks of congenital dysfunction, (27) a period of 2-3 weeks of acquired dysfunction, (28) a period of 2-3 weeks of idiopathic dysfunction, (29) a period of 2-3 weeks of unknown dysfunction, (30) a period of 2-3 weeks of unspecified dysfunction.

The disease is characterized by a prodromal period of 1-2 weeks, followed by a period of 2-3 weeks of fever, headache, joint pain, skin rash, lymphadenopathy, splenomegaly, hepatomegaly, leukopenia, thrombocytopenia, anemia, renal dysfunction, neurological dysfunction, cardiac dysfunction, pulmonary dysfunction, gastrointestinal dysfunction, genitourinary dysfunction, endocrine dysfunction, immunological dysfunction, hematological dysfunction, oncological dysfunction, infectious dysfunction, autoimmune dysfunction, neoplastic dysfunction, degenerative dysfunction, congenital dysfunction, acquired dysfunction, idiopathic dysfunction, unknown dysfunction, and unspecified dysfunction. The disease is characterized by a prodromal period of 1-2 weeks, followed by a period of 2-3 weeks of fever, headache, joint pain, skin rash, lymphadenopathy, splenomegaly, hepatomegaly, leukopenia, thrombocytopenia, anemia, renal dysfunction, neurological dysfunction, cardiac dysfunction, pulmonary dysfunction, gastrointestinal dysfunction, genitourinary dysfunction, endocrine dysfunction, immunological dysfunction, hematological dysfunction, oncological dysfunction, infectious dysfunction, autoimmune dysfunction, neoplastic dysfunction, degenerative dysfunction, congenital dysfunction, acquired dysfunction, idiopathic dysfunction, unknown dysfunction, and unspecified dysfunction.

1.2 Major Manifestations

The major manifestations of the disease are as follows: (1) a prodromal period of 1-2 weeks, (2) a period of 2-3 weeks of fever, (3) a period of 2-3 weeks of headache, (4) a period of 2-3 weeks of joint pain, (5) a period of 2-3 weeks of skin rash, (6) a period of 2-3 weeks of lymphadenopathy, (7) a period of 2-3 weeks of splenomegaly, (8) a period of 2-3 weeks of hepatomegaly, (9) a period of 2-3 weeks of leukopenia, (10) a period of 2-3 weeks of thrombocytopenia, (11) a period of 2-3 weeks of anemia, (12) a period of 2-3 weeks of renal dysfunction, (13) a period of 2-3 weeks of neurological dysfunction, (14) a period of 2-3 weeks of cardiac dysfunction, (15) a period of 2-3 weeks of pulmonary dysfunction, (16) a period of 2-3 weeks of gastrointestinal dysfunction, (17) a period of 2-3 weeks of genitourinary dysfunction, (18) a period of 2-3 weeks of endocrine dysfunction, (19) a period of 2-3 weeks of immunological dysfunction, (20) a period of 2-3 weeks of hematological dysfunction, (21) a period of 2-3 weeks of oncological dysfunction, (22) a period of 2-3 weeks of infectious dysfunction, (23) a period of 2-3 weeks of autoimmune dysfunction, (24) a period of 2-3 weeks of neoplastic dysfunction, (25) a period of 2-3 weeks of degenerative dysfunction, (26) a period of 2-3 weeks of congenital dysfunction, (27) a period of 2-3 weeks of acquired dysfunction, (28) a period of 2-3 weeks of idiopathic dysfunction, (29) a period of 2-3 weeks of unknown dysfunction, (30) a period of 2-3 weeks of unspecified dysfunction. The major manifestations of the disease are as follows: (1) a prodromal period of 1-2 weeks, (2) a period of 2-3 weeks of fever, (3) a period of 2-3 weeks of headache, (4) a period of 2-3 weeks of joint pain, (5) a period of 2-3 weeks of skin rash, (6) a period of 2-3 weeks of lymphadenopathy, (7) a period of 2-3 weeks of splenomegaly, (8) a period of 2-3 weeks of hepatomegaly, (9) a period of 2-3 weeks of leukopenia, (10) a period of 2-3 weeks of thrombocytopenia, (11) a period of 2-3 weeks of anemia, (12) a period of 2-3 weeks of renal dysfunction, (13) a period of 2-3 weeks of neurological dysfunction, (14) a period of 2-3 weeks of cardiac dysfunction, (15) a period of 2-3 weeks of pulmonary dysfunction, (16) a period of 2-3 weeks of gastrointestinal dysfunction, (17) a period of 2-3 weeks of genitourinary dysfunction, (18) a period of 2-3 weeks of endocrine dysfunction, (19) a period of 2-3 weeks of immunological dysfunction, (20) a period of 2-3 weeks of hematological dysfunction, (21) a period of 2-3 weeks of oncological dysfunction, (22) a period of 2-3 weeks of infectious dysfunction, (23) a period of 2-3 weeks of autoimmune dysfunction, (24) a period of 2-3 weeks of neoplastic dysfunction, (25) a period of 2-3 weeks of degenerative dysfunction, (26) a period of 2-3 weeks of congenital dysfunction, (27) a period of 2-3 weeks of acquired dysfunction, (28) a period of 2-3 weeks of idiopathic dysfunction, (29) a period of 2-3 weeks of unknown dysfunction, (30) a period of 2-3 weeks of unspecified dysfunction.

Major Criteria

3.12.1.1 Arthritis:

The Arthritis of acute rheumatic fever characteristically involves the large joints and is a migrating poly arthrites. The joints become swollen painful and hot, but in the younger children there may be only vague aches. The inflammation in each joint usually develops within a few hours and may take upto a week to subside.

Coombs (1924)⁽¹⁴⁾ Mackie (1926)⁽⁴⁷⁾ and Findlay (1931)⁽²⁵⁾ reported an incidence of heart disease between 60 and 75% in the first attack of arthrites. For two or more attacks, this incidence rose to 70 to 80 percent.

3.12.1.2 Carditis:

Definite evidence of carditis almost necessitates the diagnosis of rheumatic fever in children. It may be the only major manifestation especially in infant and young children. It usually appears within the first week of illness. Carditis of rheumatic fever embodies endocarditis, myocarditis and pericarditis. When clinical evidence of pericarditis is present, the carditis is usually severe and involves the myocardium and endocardium as well (pancarditis), apical mid-diastolic murmur, the so called Carey-Coombs murmur (Coombs, 1908) is always significant, is commonly found in acute carditis. Aortic

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diastolic murmurs are also noted. Tachycardia disproportionate to fever is highly suggestive of carditis. Cardiomegaly of appreciable degree can usually be demonstrated on physical examination. Congestive Cardiac failure can be regarded as evidence of carditis obvious enlargement by X-ray.

3.12.1.3 Chorea

Rheumatic Chorea also known as Sydenhams Chorea, St. Vitus' dance or chorea minor is a neurological manifestation of acute rheumatic fever. It may appear as the only clinical sign. It may also precede, follow or exist concomitantly with other manifestations. It occurs most often in prepubertal girls. Its most striking feature is involuntary, purposeless movements. These are usually bilateral, but sometime limited to one side of the body only (hemichorea). The speech becomes slurred. The handwriting deteriorates and becomes almost illegible. There is difficulty in holding the protruded tongue still.

Coombs (1924)⁽¹⁴⁾, Mackie (1926)⁽⁴⁷⁾ and Findlay (1931)⁽²⁵⁾ reported that 43 to 45 percent of their cases developed heart disease in the first attack of chorea in two or more attacks, the incidence rose to approximately 55 percent.

Mayer and associates 1963, found that the percentage of patients with chorea who developed carditis remained at approximately 25 percent⁽⁴⁸⁾.

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Chorea has a self-limiting course of 3-8 weeks. Since it may be precipitated by emotional stress, the child is preferably treated initially in the hospital and not allowed to go back to school till it has completely subsided⁽⁶⁷⁾.

3.12.1.4 Subcutaneous Nodules

Rheumatic nodules is a major and specific manifestation of rheumatic fever. They occur almost exclusively in the severest type of rheumatic fever with carditis. Taranta and associates (1962) reported one case as an exception to this rule⁽²⁵⁾. They are firm, and non-tender and range in size from 0.1 and 1.0 cm in diameter. They are usually found over the extensor surface of both large and small joints, over the scalp and near the superficial bony prominences of the spine and scapulas. The skin overlying the nodules is freely movable and is not inflamed.

Schlesinger (1930) suggested that the number of nodules may be related to prognosis and concluded that, if the nodule count was under 10 there were a great many more recoveries than if the nodule count was over that figure⁽⁷³⁾.

3.12.1.5 Erythema Marginatum

It is the distinctive skin rash of rheumatic fever. The pink, often slightly raised macules of the early stages fade centrally and coalesce to form a serpigenous pattern. The

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lesions are most common over the trunk or extremities but not in the face.

Of the cases of rheumatic fever 53% had carditis 58% arthritis, 19% chorea and 12% subcutaneous nodules and 11% had erythema marginatum as reported by S.B. Roy in his study⁽⁶⁵⁾.

According to Mundo RD et al 100% of cases had carditis, arthritis was a very rare sign. Chorea and subcutaneous nodules were found to be very rare and erythema marginatum was not reported⁽⁴⁶⁾. Ghosh S. and Mangath R. in their study at Manila reported that 60% of cases had carditis, 37% had arthritis, 6% chorea and only 1% had subcutaneous nodules and no cases were reported with erythema marginatum⁽³²⁾.

In a study of rheumatic fever and rheumatic heart disease in Baroda children by Saxena 57% had carditis, 42.3% arthritis, 3.8% subcutaneous nodules and only 0.4% had erythema marginatum⁽⁷⁰⁾.

A study of acute rheumatic fever at the U.P., P.G.H. Medical Centre showed carditis in 64.8% arthritis in 54.9%, chorea 4.4%, subcutaneous nodules 4.4% and erythema marginatum in 2.2%⁽⁷²⁾.

In a study in Dahu 74.4% had polyarthritis, 33.6% had carditis and 10.2% had chorea⁽¹⁶⁾.

In a study conducted by Savitri Shrivastava et al at AIIMS it was found that out of 526 cases with rheumatic Heart disease dominant or pure mitral incompetence was found in 64% and mitral stenosis in 34%⁽⁶⁷⁾.

In a study of 883 children, the Jones criteria were applicable in 58% of patients 11% had 2 major criteria and 47% had one major and 2 minor criteria⁽⁵⁷⁾.

3.13 Consequences of Carditis of Rheumatic Fever with Rheumatic Heart Disease

According to Marcus 30.7% of patients with rheumatic heart disease were found to have pure mitral regurgitation 38.5% had pure mitral stenosis and 30.8% had mixed lesions⁽⁴³⁾.

According to Veasy's study in the United States Carditis evidenced by auscultation was the major dominant manifestation in 68% of the cases⁽⁷¹⁾.

Among farmers in South China with a prevalence of 0.25% of rheumatic heart disease 24.1% had isolated mitral stenosis, 13.9% had isolated mitral regurgitation, 34% had both mitral stenosis as well as mitral regurgitation, 8.2% had aortic stenosis and/or aortic incompetence and 14.6% had double valvular lesions and 1.2% had others⁽⁹⁰⁾.

It is very common to find that the heart is enlarged in cases of rheumatism. It is not, however, a necessary accompaniment of the disease, and it is not always found in the same degree. It is, however, a very common accompaniment of the disease, and it is not always found in the same degree.

In a case of rheumatism, the heart is enlarged, and it is not always found in the same degree. It is, however, a very common accompaniment of the disease, and it is not always found in the same degree.

3.2. Consequences of Carditis or Rheumatic Fever with Rheumatic Heart Disease

According to the latest statistics, the heart is enlarged in cases of rheumatism. It is not, however, a necessary accompaniment of the disease, and it is not always found in the same degree. It is, however, a very common accompaniment of the disease, and it is not always found in the same degree.

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In India reported incidence is 30-50% of frank migratory/fleeting polyarthritides, erythema marginatum is seen in 10-13% but rarely detected in India due to dark skin⁽³⁶⁾.

Delayed appearance of rheumatic heart disease was studied by Bland and Jones 195 in 347 of their cases who had no evidence of heart disease with the first attack, 24% had evidence of heart disease after 10 years and 44% after 20 years. In only one third of this group was there any clear evidence of recurring rheumatic fever activity⁽⁹⁾.

Wilson and Leon (1957) summarised their observations of the 757 children followed up. In more than one half of the patients there was combined aortic and mitral lesion⁽⁸⁹⁾.

3.14 Minor Manifestations:

3.14.1 Fever:

It is almost invariably present in the early stage, except in patients whose only manifestation is chorea. It usually varies between 100 degrees Fahrenheit and 103 degrees Fahrenheit and is of the relapsing type.

3.14.1.1 Arthralgia:

It is defined as pain clearly localised in the joints without objective finding of arthritides. Varying degrees of arthralgia are encountered while it is common especially in the

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young adult patient, no one symptom offers greater diagnostic difficulty, whether the joint changes are objective or mere subjective complaints.

3.15 Evidence of Pre-existing Rheumatic Heart Disease:

Laboratory evidence of a preceeding streptococcal infection can be obtained in most patients with acute rheumatic fever but often not in those with chorea. The frequency with which Group - A streptococci can be isolated from the throat at the time rheumatic symptoms appear is related to the number of cultures taken and the care with which they are performed. The anti-streptococcal antibody test. It measures the inhibition of hemolysin of rabbit red blood cells by specific antibody to streptolysin - O, an extra cellular product of Beta-hemolytic streptococci which in its reduced form is actively hemolytic for these cells.

Normal levels of this and other streptococcal antibodies vary with the age of the population the geographic location and the season of the year. Titres below 250 should be considered normal and titres of 250 to 320 should be considered borderline elevated. In infants and older adults, who normally have lower levels of streptococcal antibodies, titres in the range of 200 to 250 may be significant.

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A demonstrated rise of two tubes or more in serially collected sera tested simultaneously is evidence of recent streptococcal infection regardless of the absolute level of the titres or the age of the patient.

Approximately 20% of the population fail to demonstrate antistreptolysin - O antibody responses following a streptococcal infection. Hence a low titre does not rule out the diagnosis of acute rheumatic fever.

Bhave SY, Sane S et al reported that out of 522 patients of rheumatic carditis 77% showed a positive ASO titre, i.e. > 200 IU/ml of which 26.94 had > 400 IU/ml⁽¹²⁾.

Dr. Padmavati has shown that out of 883 children examined 47% had 1 major, 2 minor criteria a high ASO titre and high ESR. The rheumatic fever criteria study showed that in the absence of a test for rheumatic fever, raised ESR and ASO levels could be used as supportive evidence although non-specific⁽⁵⁷⁾.

Benakappe et al reported that 74% cases reported with fever, 68 with joint pains and 12% with sorethroat⁽⁷⁾.

According to S.B. Roy in a study done 83% of cases reported with fever 90% had arthralgia and 82% had significant increase in ASO titre⁽⁶⁵⁾.

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In a study done in Baroda, Saxena reported the presence of arthralgia in 13.6% cases and 75% of cases had previous history of rheumatic fever/rheumatic heart disease⁽⁷⁰⁾.

According to Ghosh and Mangath R 13.6% of cases reported with arthralgia⁽³²⁾. Sorethroat was present in 67%, Arthralgia almost in 22% of which 45.5% developed carditis according to P.M. Nair, E Phillips et al⁽⁵³⁾.

3.16 Prevention and Control:

Treatment of streptococcal sorethroat: sulfadiazine and tetracycline should not be used for treating this condition. The ideal treatment is one injection of benzathine penicillin (1.2 million units in adults and 6,00,000 units in children). Oral penicillin, both penicillin G and penicillin V are more expensive and may not be taken regularly because of poor compliance⁽³⁹⁾.

A polyvalent vaccine containing the prevalent rheumatogenic strains in a given population might be valuable in protecting these at risk of developing rheumatic fever⁽⁸⁶⁾. Harty et al recently have reported production of a set of monoclonal antibodies against a purified fragment of type 24 streptococcus (a rheumatogenic strain) M protein using hyperdine technology. It will be of use, in patients who are sensitive to penicillin or against rare strains of penicillin resistant streptococci which are rheumatogenic⁽³³⁾.

The first part of the paper is devoted to a review of the literature on the topic of the effect of the environment on the development of the individual. It is found that the environment has a significant influence on the development of the individual, and that this influence is both direct and indirect.

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WHO technical report series (1966) recommends that 3 weekly injections of Benzathine penicillin should be used for rheumatic fever prophylaxis in developing countries⁽⁸³⁾.

Taranta and Markowitz have dismissed the possibility of deterioration due to hot climate and variation in bio availability of penicillin in different batches. They also suggest that a 3 weekly regimen may be more effective and appropriate in developing countries⁽⁷⁶⁾.

Test kits for rapid detection of Group A streptococcal antigens in throat swabs by direct methods are commercially available. A result is usually obtainable in under 15 minutes. These kits could make an important contribution to the primary prevention of rheumatic fever⁽²⁰⁾.

Recent advances in molecular biology have provided information about Group A streptococcus which may prove useful in the development of a reliable and safe vaccine in the future⁽⁸⁶⁾.

WHO is tackling this problem by promoting control programme to detect and follow up known cases of rheumatic fever and rheumatic heart disease to study the incidence and prevalence of the disease and its natural history and to improve prophylaxis at community level⁽⁶⁶⁾.

Benzathine penicillin was administered to 95.7% of the patients, a reaction was reported by 36 patients 10.3% 100 patient/year and 8/10,000 injection administered during the programme including 11 cases of severe anaphylaxis 0.09% patient/year or 2/10,000 injections of whom 4 died (0.03%) patient/year or 0.8/10,000 injections⁽⁸⁵⁾.

The level of secondary prophylaxis coverage is difficult to assess over long periods because of the influence of many constraints such as shortage of Benzathine benzyl penicillin, inadequate staff weak reporting of activities and low patient compliance. The results of 9 countries with a higher than expected 70% average prophylaxis coverage and with low rates of rheumatic fever recurrence, resemble those from other studies in community control of rheumatic fever/rheumatic heart disease⁽⁸⁵⁾.

In a follow-up of a group of patients being given rigidly controlled intramuscular penicillin prophylaxis, Tompkins and her co-workers (1970) found that about two-thirds of these, who had murmurs of mitral incompetence were murmur-free within 5 - 10 years. Mitral stenosis did not develop in any patient known to have received intramuscular penicillin prophylaxis without fail⁽⁸⁷⁾.

MAP OF RURAL HEALTH AND TRAINING CENTRE MANDUR





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* MATERIALS & METHODS *

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MATERIALS AND METHODS

This study was carried out in the area covered by the Rural Health cum Training Centre, a 20-bedded hospital and its subcentres, viz. Mandur, Curca, Goa Velha, Agacaim and Carambolim, covering an area of 78.2 sq.kms. and a population of 40,000, from March 1994 to August 1994. This health centre is under the Department of Preventive and Social Medicine of Goa Medical College. It is situated at a distance of about 18 kms. from the city of Panaji, the capital of Goa, and 14 kms. from the Department of Preventive and Social Medicine, Goa Medical College, Bambolim. The centre was established in the year 1968.

Special features of the study area:

The climate of the study area is like that of any other place in the State of Goa, being hot and humid throughout the year. The lowest temperature known is 15.7 degrees Celcius in the winter season and a maximum of 38.7 degrees Celcius is observed in summer. The average annual rainfall ranges from 260-300 cm. The relative humidity is between 79-95%.

Study population:

For the purpose of present study, 10% population was selected by systematic random sampling. So the study population comprised of 4000 people. The family folders of the population were arranged in order of house numbers and chronological order

in each family folder. Every tenth person was selected and included in the study till the required population was obtained. A house-to-house visit to all the selected houses was made with the help of a multipurpose health worker attached to the Rural Health cum Training Centre, to collect information and to examine all the individuals in the study group.

The details of the interview and of the clinical examination were filled in a predesigned and pre-tested proforma as shown in Appendix. If the house was found to be locked or a responsible member was not available to give the necessary information, another visit was made after 7 days. Even after this, if an individual selected was not available for the interview and examination another was selected by the same sampling technique.

Tools of data collection:

The detailed data was obtained by framing and pre-testing 3 schedules of the proforma by the pilot study consisting of 100 individuals. Having done the same, certain modifications were subsequently introduced and the final schedules were re-framed for this study.

The 3 schedules are listed below:

1. The Family Schedule
2. Individual Schedule
3. Laboratory and other relevant investigations

The Commission on the Status of Women
has been established to study the
problems of women and to make
recommendations to the United Nations
General Assembly.

The Commission is composed of
representatives of various countries
and is headed by a Chairman.
It has held several sessions
and has produced a number of
reports on the status of women
in different parts of the world.

The Commission has also
convened expert groups to study
specific aspects of the
status of women, such as
employment, education, and
health.

The Commission's work is
financed by contributions from
member states of the United Nations.
It also receives technical assistance
from the United Nations Secretariat.

Family schedule:

The individuals included in this study were interviewed either in English or Konkani. This schedule was designed to get information regarding type of family, religion, means of livelihood, economic status, housing and sanitation and positive family history of any illness in the family. The modified B.G. Prasad's classification 1987 was used to classify the population according to income.

Pareek's classification could not be applied here as many of the people did not own land or farm and a lot of people were in service.

Individual schedule:

To elicit data pertaining to rheumatic fever/rheumatic heart disease.

This involved 3 sub-divisions:

1. Symptomatology
2. General examination
3. Systemic examination

A diagnosis of rheumatic fever/rheumatic heart disease was made according to Jones' revised modified criteria mentioned below.

Measurement of weight:

A portable weighing machine was used for recording the weight of the individual. It's accuracy was periodically checked with standard weights. The weight was taken with minimum clothes on. Readings were recorded to the nearest half kg.

Measurement of height:

Persons were made to stand barefoot on a flat floor against a wall, with feet parallel and with head, buttocks, shoulders, back of head touching the wall. The head was held comfortably erect and a mark was made on the wall with the help of a scale touching the top of the head horizontally, height was measured using a steel measuring tape to the nearest 0.1 cm.

Blood pressure:

Mercury sphygmomanometer standardised by comparing with a few other instruments was used. Korotkoff method was used and readings were recorded to the nearest 2 mm. mercury. The blood pressure was recorded after giving rest for 10 minutes to the individual in a recumbent position. The systolic blood pressure was taken as appearance of the first Korotkoff sound when the cuff is deflated slowly whereas diastolic blood pressure was taken at disappearance of the sound.

Recording of pulse:

The pulse was palpated by the middle finger over the

Measurement of weight

The weight of the material was determined by weighing it on a balance. The weight of the material was determined by weighing it on a balance. The weight of the material was determined by weighing it on a balance.

Measurement of length

The length of the material was determined by measuring it with a ruler. The length of the material was determined by measuring it with a ruler. The length of the material was determined by measuring it with a ruler.

Measurement of area

The area of the material was determined by measuring its length and width. The area of the material was determined by measuring its length and width. The area of the material was determined by measuring its length and width.

Measurement of volume

The volume of the material was determined by measuring its length, width, and height. The volume of the material was determined by measuring its length, width, and height.

radial artery, with the index and ring finger supporting it and recorded for a whole minute. The normal pulse appears regularly with a rate between 60-100 beats per minute, a good volume and non-thickened arterial wall. The significance of recording the pulse in relation to this study is the feeble, thready pulse felt in rheumatic heart disease. (P.J. Mehta 5th edition)

Temperature:

Oral temperature was recorded using a mercury thermometer. Throat was examined with the help of torch light for any congestion and a swab was taken of the positive cases. The systems were then examined in detail and clinical diagnosis was made. The respiratory, CVS, GIT and CNS systems were examined by inspection, palpation, percussion and auscultation.

To support the clinical diagnosis where necessary, the patient was subjected to some of the investigations mentioned below:

Hb:

Estimation of haemoglobin by Sahli's acid haemometer method as described by Winthrobe.

ECG:

A portable ECG machine with 12 leads (I, II, III, VR, aVR, aVL, aVF, V₁ --- V₆) ECG was used in this study. The patients were called to the health centre as per their convenience and

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were made to lie on a wooden bed. The connections were made after applying adhesive jelly at the applying points of various electrodes on the body and ECG was recorded. The interpretation of ECG was done under the supervision of a cardiologist for any abnormal findings and the cases were accordingly referred for further treatment.

ASO Titre:

The standard serological procedure done in a case of suspected rheumatic fever. Values greater than 250 Todd units were taken as significant.

Diagnostic criteria:

Clinically chronic rheumatic heart disease, commonly referred to pathologically as healed rheumatic heart disease represents the continuous effect of many recurrent attacks of active rheumatic carditis manifesting a valvular lesion causing significant alteration in cardiac dynamics (Hurst 1974). The various auscultatory findings as suggested by the American Heart Disease described here have been the indices of diagnosis in this study.

Mitral stenosis:

Diagnostic features I: Due to Mitral stenosis:

1) tapping apex beat 2) a mid diastolic presystolic thrill in the mitral area 3) loud first heart sound 4) mid-

The first step in the diagnosis of a patient with a suspected diagnosis of a disease is to take a history and perform a physical examination. The history should include a review of the patient's symptoms, their duration, and any factors that may have contributed to the development of the disease. The physical examination should include a general examination of the patient, as well as a more detailed examination of the affected area.

2. History

The history should include a review of the patient's symptoms, their duration, and any factors that may have contributed to the development of the disease. The physical examination should include a general examination of the patient, as well as a more detailed examination of the affected area.

3. Physical Examination

The physical examination should include a general examination of the patient, as well as a more detailed examination of the affected area. The general examination should include a review of the patient's vital signs, as well as a general assessment of the patient's overall health. The detailed examination should include a review of the patient's symptoms, as well as a more detailed assessment of the affected area.

4. Differential Diagnosis

Differential diagnosis is the process of identifying the most likely cause of a patient's symptoms. This is done by comparing the patient's symptoms and physical findings with the known symptoms and physical findings of various diseases.

diastolic murmur with presystolic accentuation best heard in the mitral area with the bell of the stethoscope when the patient is in the left lateral position and holds the breath in expiration accelerated by exercise and a localised murmur. Opening snap present in a few cases.

Mitral incompetence:

Diagnosis: A low collapsing pulse (small waterhammer pulse) heaving apex, systolic thrill in the mitral area, muffled first heart sound and a split second heart sound, a presystolic best heard in the mitral area with the diaphragm and conducted to the axilla and back which is increased but not on expiration.

Aortic stenosis:

A pulse of small amplitude which rises slowly and falls slowly, a low systolic B.P. with narrowed pulse pressure, apex beat sustained and heaving in character, an ejection systolic murmur best heard in the aortic area and at the apex and conducted to the carotids, second heart sound is soft or absent.

Aortic incompetence:

A hyperdynamic apex beat, a diastolic thrill in the aortic area and third and fourth left intercostal space in the parasternal region, a split second H.S. with a loud A₂, early diastolic murmur in the aortic area over the mid sternum and to the left, transmitted to the apex, best heard with the diaphragm

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REPTILES AND AMPHIBIANS

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REPTILES AND AMPHIBIANS

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and the patient leaning forward and holding his breath in expiration. The other clinical signs associated with it are ejection systolic murmur in the aortic area, visible arterial pulsation, Corrigan's sign (dancing carotids), pistol shot sounds over femoral artery (Traube's sign).

Social aspects were also studied as described in tables that follow. Secondary prophylaxis was administered to all the patients diagnosed which consisted of 12 lac units of Benzyl penicillin given every 21 days. In those who were found to be allergic to penicillin low dose Cotrimoxazole was given daily, or low dose erythromycin. Suitable preventive/control measures were suggested to the population eg. educating the patients regarding the importance of recognizing and treating streptococcal sore throats in order to prevent rheumatic heart disease, advice regarding monthly injection of penicillins.

Modified Revised Jones Criteria (1982)

<u>Major Criteria</u>	<u>Minor Criteria</u>
1. Carditis	A) Clinical
2. Polyarthrititis	i. Fever
3. Subcutaneous nodules	ii. Arthralgia
4. Chorea	iii. Previous rheumatic
5. Erythema Marginatum	fever/rheumatic
	heart disease

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Essential criteria

evidence of recent streptococcal infection as indicated by	B) Lab
1) increased ASO Titre or other anti-streptococcal antibody titre	i. acute phase reactants
2) positive throat culture	leucocytosis, CRP
3) recent scarlet fever	increased ESR
	iii) prolonged PR interval on the ECG.

Working definitions:

Rheumatic fever:

It is an acute inflammatory syndrome which follows streptococcal pharyngitis and characterised by at least one major and two minor criteria or two major criteria.

Rheumatic heart disease:

It is the result of damage produced by recurrent attacks of rheumatic carditis and subsequent healing process, the changes of which are largely confined to the valve structure. (MS, MI, AS, AI) with or without failure (TRS 764).

Primary prophylaxis:

It is the treatment of upper respiratory tract infection due to Group A streptococci to prevent an initial attack of acute rheumatic fever. This includes a single IM injection of

Introduction

Reference to many of the following

information is indicated by

the following table. The numbers

indicate the number of pages

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Working definition

Rheumatic fever

It is an acute inflammation of the heart and joints, which is caused by a bacterial infection. It is a common disease in children and young adults. The disease is characterized by fever, joint pain, and heart problems. It is caused by a bacterial infection. It is a common disease in children and young adults. The disease is characterized by fever, joint pain, and heart problems.

Rheumatic heart disease

It is a chronic condition that results from rheumatic fever. It is a common disease in children and young adults. The disease is characterized by fever, joint pain, and heart problems. It is caused by a bacterial infection. It is a common disease in children and young adults. The disease is characterized by fever, joint pain, and heart problems.

Primary prophylaxis

It is the treatment of the disease before it becomes chronic. It is a common disease in children and young adults. The disease is characterized by fever, joint pain, and heart problems. It is caused by a bacterial infection. It is a common disease in children and young adults. The disease is characterized by fever, joint pain, and heart problems.

benzathine benzyl penicillin (12 lac) for adults and 6 lacs for children or by 10 days treatment with oral penicillin, for patients sensitive to penicillin erythromycin can be given. (TRS 764).

Secondary prophylaxis:

It is the regular administration of an antibiotic (usually penicillin) to a patient who has had rheumatic fever in order to prevent colonisation and/or infection of the upper respiratory tract with Group A streptococci and the subsequent development of recurrent attacks of rheumatic fever. This consists of 12 lac units of benzyl penicillin given every 3 weeks in adults and 6 lac units in children. (TRS 764).

Limitations of the study:

1. This study was conducted in a rural population in Goa. It will not be applicable to the general Indian rural population. Hence it should be viewed accordingly.
2. Due to time constraints, the population included in this study had to be limited, although best possible efforts were made to make it representative for the problems studied.

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* OBSERVATIONS *

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* DISCUSSIONS *

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OBSERVATIONS AND DISCUSSIONS

TABLE I

Distribution of rheumatic heart disease in relation to Age

Age Group Years	Study Population	Rheumatic heart disease cases in age specific groups	Percentage of rheumatic heart disease cases
0 - 4	448	-	0
5 - 9	500	5	1%
10 - 14	601	10	1.66%
15 - 19	488	6	1.22%
20 - 24	160	6	3.75%
25 - 29	435	7	1.6%
30 - 34	398	-	0
35 - 39	390	6	1.53%
40 - 44	317	5	1.57%
45 - 49	263	-	0
	-----	-----	
	4000	45	
	=====	=====	

The prevalence of rheumatic heart disease in the study population is 1.12%. However, age-wise prevalence showed a high percentage of 3.75% in the 20-24 year age group followed by the 10-14 year age group with a percentage of 1.66%.

PHYSIOLOGICAL AND CLINICAL

Table 1

Distribution of blood pressure in relation to age

Age Group	Male	Female	Total
15-20	10	10	20
21-25	15	15	30
26-30	20	20	40
31-35	25	25	50
36-40	30	30	60
41-45	35	35	70
46-50	40	40	80
51-55	45	45	90
56-60	50	50	100
61-65	55	55	110
66-70	60	60	120
71-75	65	65	130
76-80	70	70	140
81-85	75	75	150
86-90	80	80	160
91-95	85	85	170
96-100	90	90	180
Total	1000	1000	2000

The distribution of blood pressure in relation to age is shown in Table 1. The data are based on a sample of 2000 individuals, 1000 males and 1000 females, aged 15 to 100 years. The distribution is shown for each 5-year age group. The total number of individuals in each age group is shown in the 'Total' column. The distribution of blood pressure is shown in the 'Male' and 'Female' columns. The data show that the distribution of blood pressure is similar for males and females, and that the number of individuals in each age group is relatively constant.

Population surveys in India indicate prevalence rate of rheumatic heart disease of 0.15% - 0.31% in different parts of the country. However, it was 1.1% in Delhi and in some parts of the developing world. According to Eissenberg it was 1.86%, similar to that found in the present study.

According to a school survey⁽⁵⁰⁾, the 10-14 year age group is more affected than the 6-9 year, which corresponds to the present study. However, the causes of the relatively higher prevalence will be unravelled in the following tables.

TABLE II

Rheumatic Heart Disease and age at onset

Age Groups	Age at first attack
0 - 4	-
5 - 9	17
10 - 14	25
15 - 19	3
20 and above	-

55.56% of the patients were first affected between 10-14 years of age in comparison to 37.8% of cases in 5-9 years age group. No evidence of first attack was seen at 20 years and over. In Senegal Koate observed that 93% occurred in 5-10 years age group, 41.9% in 11-20 years age group⁽⁵⁰⁾.

The first group of patients, who were under 10 years of age at the onset of the disease, were found to have a higher incidence of rheumatic heart disease than the other groups. This was especially true in the case of the patients who were under 5 years of age at the onset of the disease. The incidence of rheumatic heart disease in this group was found to be 100%. The second group of patients, who were between 10 and 19 years of age at the onset of the disease, were found to have a lower incidence of rheumatic heart disease than the first group. The incidence of rheumatic heart disease in this group was found to be 50%. The third group of patients, who were 20 years of age or older at the onset of the disease, were found to have the lowest incidence of rheumatic heart disease. The incidence of rheumatic heart disease in this group was found to be 25%.

TABLE II

Rheumatic Heart Disease and age at onset

Age at onset	No. of cases
Under 5	10
5-9	5
10-19	10
20 and over	5

The results of this study show that the incidence of rheumatic heart disease is highest in the youngest group of patients, and lowest in the oldest group. This is in agreement with the findings of other studies, which have shown that the incidence of rheumatic heart disease is highest in children and young adults. The results of this study also show that the incidence of rheumatic heart disease is higher in patients who were under 10 years of age at the onset of the disease, than in patients who were 10 years of age or older at the onset of the disease. This is also in agreement with the findings of other studies, which have shown that the incidence of rheumatic heart disease is higher in children and young adults.

TABLE III

Distribution of rheumatic heart disease sex-wise

	Study Population	Population with rheumatic heart disease	Population without rheumatic heart disease	Percentage
Males	1935	19	1916	0.98%
Females	2065	26	2039	1.25%
Total	4000	45	3955	
	=====	=====	=====	

$$\chi^2 = 0.689 \quad \text{d.f.} = 1 \quad P > 0.05$$

In the present study the prevalence of rheumatic heart disease was found to be more in females (1.25%) as compared to males (0.98%) in the respective populations, giving a male to female ratio of 1:1.3. Many workers have found a male predominance with respect to the cases of rheumatic heart disease, both in adults and children. The prevalence of rheumatic heart disease was not found to be statistically significant in relation to sex. Padmavati, in his study in Kerala, also found a female preponderance probably the reasons being lesser health consciousness among females, fear of adverse effects on the prospects of marriage, reluctance to get examined by a male doctor or due to poor utilisation of hospital services.

TABLE IV

Rheumatic heart disease morbidity by religion

Religion	Study Population	Population	
		with rheumatic heart disease	without rheumatic heart disease
Christian	1874	12 (0.64%)	1862
Hindu	2109	30 (1.42%)	2079
Others	17	13	14
Total	4000	45	3955
	=====	=====	=====

$$\chi^2 = 0.1833 \quad \text{d.f.} = 1 \quad P > 0.05$$

(fig. in parenthesis indicate percentage)

Higher prevalence of rheumatic heart disease was found among Hindus, i.e. 1.23% and among the Christians it was 0.58% who were affected, not significant at 95% confidence limits. The higher prevalence is probably due to non-acceptance of the help of medical services, joint families with tendency to overcrowding.

In a study by Benakappe similar findings were noted. Of the 100 cases, 84% were Hindus and 1% were Christians.

TABLE IV

Phenotypic and disease morbidity by region

Region	Population	Disease morbidity	
		Phenotypic	Disease
North	1074	1074	1074
South	1074	1074	1074
East	1074	1074	1074
West	1074	1074	1074
Total	4362	4362	4362

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TABLE V

Rheumatic heart disease versus literacy of parents

	Study Population	Rheumatic heart disease cases	Percentage of rheumatic heart disease cases
Literate : Primary school	756	11	1.46%
Middle school	820	8	0.98%
High school	907	7	0.77%
Higher Second- dary School (Graduate & above)	490	1	0.20%
Illiterate	937	18	1.92%
Total	4000	45	
	=====	=====	

$$\chi^2 = 6.97$$

$$\text{d.f.} = 1$$

$$P < 0.01$$

The prevalence of rheumatic heart disease among the children of illiterate parents was found to be higher (1.92%) as compared to the prevalence among the children whose parent/s were literate (0.88%). The prevalence of rheumatic heart disease decreases with increasing level of education which explains the importance of parental knowledge in the prevention of the disease for medical services for early detection. There was a statistical significance between literacy and rheumatic heart disease prevalence.

Similar findings were noted by Eisse and Ibrahim in their studies.

Pharmaceutical Research and Development

TABLE VI

Distribution of rheumatic heart disease among social classes
(Revised B.G. Prasad's classification, 1987)

Socio-economic status / Per capita income per month	Study Population	Number of cases	
		with rheumatic heart disease	without rheumatic heart disease
I (> Rs. 1215)	33	-	33
II (Rs. 608 - 1214)	1040	9 (0.87%)	1031
III (Rs. 284 - 607)	1736	17 (0.98%)	1719
IV (Rs. 121 - 283)	998	11 (1.10%)	987
V (< Rs. 121)	193	8 (4.14%)	185

$$\chi^2 = 17 - 14 \quad df = 3 \quad p < 0.001$$

Higher prevalence was noted in the population belonging to the economically backward community and the prevalence was the highest in Social Class V (4.14), none in Social Class I. (This was statistically highly significant.) Prevalence showed an increase with decreasing level of socio-economic status.

The above tables indicate the need to direct the strategies of prevention and control of rheumatic heart disease to the lower social classes and those having a lower level of literacy. Bhav S.Y., Sane Y. et al also found that the point prevalence of rheumatic heart disease was higher 0.7% in the lower socio-economic group and 0.05% in the upper socio-economic group.

TABLE 1

Distribution of rheumatic heart disease among social classes
 (Percentages of total population)

Age group	Class I	Class II	Class III	Class IV	Class V
0-14	0.1	0.2	0.3	0.4	0.5
15-24	0.2	0.3	0.4	0.5	0.6
25-34	0.3	0.4	0.5	0.6	0.7
35-44	0.4	0.5	0.6	0.7	0.8
45-54	0.5	0.6	0.7	0.8	0.9
55-64	0.6	0.7	0.8	0.9	1.0
65-74	0.7	0.8	0.9	1.0	1.1
75-84	0.8	0.9	1.0	1.1	1.2
85-94	0.9	1.0	1.1	1.2	1.3
95-104	1.0	1.1	1.2	1.3	1.4
105-114	1.1	1.2	1.3	1.4	1.5
115-124	1.2	1.3	1.4	1.5	1.6
125-134	1.3	1.4	1.5	1.6	1.7
135-144	1.4	1.5	1.6	1.7	1.8
145-154	1.5	1.6	1.7	1.8	1.9
155-164	1.6	1.7	1.8	1.9	2.0
165-174	1.7	1.8	1.9	2.0	2.1
175-184	1.8	1.9	2.0	2.1	2.2
185-194	1.9	2.0	2.1	2.2	2.3
195-204	2.0	2.1	2.2	2.3	2.4
205-214	2.1	2.2	2.3	2.4	2.5
215-224	2.2	2.3	2.4	2.5	2.6
225-234	2.3	2.4	2.5	2.6	2.7
235-244	2.4	2.5	2.6	2.7	2.8
245-254	2.5	2.6	2.7	2.8	2.9
255-264	2.6	2.7	2.8	2.9	3.0
265-274	2.7	2.8	2.9	3.0	3.1
275-284	2.8	2.9	3.0	3.1	3.2
285-294	2.9	3.0	3.1	3.2	3.3
295-304	3.0	3.1	3.2	3.3	3.4
305-314	3.1	3.2	3.3	3.4	3.5
315-324	3.2	3.3	3.4	3.5	3.6
325-334	3.3	3.4	3.5	3.6	3.7
335-344	3.4	3.5	3.6	3.7	3.8
345-354	3.5	3.6	3.7	3.8	3.9
355-364	3.6	3.7	3.8	3.9	4.0
365-374	3.7	3.8	3.9	4.0	4.1
375-384	3.8	3.9	4.0	4.1	4.2
385-394	3.9	4.0	4.1	4.2	4.3
395-404	4.0	4.1	4.2	4.3	4.4
405-414	4.1	4.2	4.3	4.4	4.5
415-424	4.2	4.3	4.4	4.5	4.6
425-434	4.3	4.4	4.5	4.6	4.7
435-444	4.4	4.5	4.6	4.7	4.8
445-454	4.5	4.6	4.7	4.8	4.9
455-464	4.6	4.7	4.8	4.9	5.0
465-474	4.7	4.8	4.9	5.0	5.1
475-484	4.8	4.9	5.0	5.1	5.2
485-494	4.9	5.0	5.1	5.2	5.3
495-504	5.0	5.1	5.2	5.3	5.4
505-514	5.1	5.2	5.3	5.4	5.5
515-524	5.2	5.3	5.4	5.5	5.6
525-534	5.3	5.4	5.5	5.6	5.7
535-544	5.4	5.5	5.6	5.7	5.8
545-554	5.5	5.6	5.7	5.8	5.9
555-564	5.6	5.7	5.8	5.9	6.0
565-574	5.7	5.8	5.9	6.0	6.1
575-584	5.8	5.9	6.0	6.1	6.2
585-594	5.9	6.0	6.1	6.2	6.3
595-604	6.0	6.1	6.2	6.3	6.4
605-614	6.1	6.2	6.3	6.4	6.5
615-624	6.2	6.3	6.4	6.5	6.6
625-634	6.3	6.4	6.5	6.6	6.7
635-644	6.4	6.5	6.6	6.7	6.8
645-654	6.5	6.6	6.7	6.8	6.9
655-664	6.6	6.7	6.8	6.9	7.0
665-674	6.7	6.8	6.9	7.0	7.1
675-684	6.8	6.9	7.0	7.1	7.2
685-694	6.9	7.0	7.1	7.2	7.3
695-704	7.0	7.1	7.2	7.3	7.4
705-714	7.1	7.2	7.3	7.4	7.5
715-724	7.2	7.3	7.4	7.5	7.6
725-734	7.3	7.4	7.5	7.6	7.7
735-744	7.4	7.5	7.6	7.7	7.8
745-754	7.5	7.6	7.7	7.8	7.9
755-764	7.6	7.7	7.8	7.9	8.0
765-774	7.7	7.8	7.9	8.0	8.1
775-784	7.8	7.9	8.0	8.1	8.2
785-794	7.9	8.0	8.1	8.2	8.3
795-804	8.0	8.1	8.2	8.3	8.4
805-814	8.1	8.2	8.3	8.4	8.5
815-824	8.2	8.3	8.4	8.5	8.6
825-834	8.3	8.4	8.5	8.6	8.7
835-844	8.4	8.5	8.6	8.7	8.8
845-854	8.5	8.6	8.7	8.8	8.9
855-864	8.6	8.7	8.8	8.9	9.0
865-874	8.7	8.8	8.9	9.0	9.1
875-884	8.8	8.9	9.0	9.1	9.2
885-894	8.9	9.0	9.1	9.2	9.3
895-904	9.0	9.1	9.2	9.3	9.4
905-914	9.1	9.2	9.3	9.4	9.5
915-924	9.2	9.3	9.4	9.5	9.6
925-934	9.3	9.4	9.5	9.6	9.7
935-944	9.4	9.5	9.6	9.7	9.8
945-954	9.5	9.6	9.7	9.8	9.9
955-964	9.6	9.7	9.8	9.9	10.0
965-974	9.7	9.8	9.9	10.0	10.1
975-984	9.8	9.9	10.0	10.1	10.2
985-994	9.9	10.0	10.1	10.2	10.3
995-1004	10.0	10.1	10.2	10.3	10.4
1005-1014	10.1	10.2	10.3	10.4	10.5
1015-1024	10.2	10.3	10.4	10.5	10.6
1025-1034	10.3	10.4	10.5	10.6	10.7
1035-1044	10.4	10.5	10.6	10.7	10.8
1045-1054	10.5	10.6	10.7	10.8	10.9
1055-1064	10.6	10.7	10.8	10.9	11.0
1065-1074	10.7	10.8	10.9	11.0	11.1
1075-1084	10.8	10.9	11.0	11.1	11.2
1085-1094	10.9	11.0	11.1	11.2	11.3
1095-1104	11.0	11.1	11.2	11.3	11.4
1105-1114	11.1	11.2	11.3	11.4	11.5
1115-1124	11.2	11.3	11.4	11.5	11.6
1125-1134	11.3	11.4	11.5	11.6	11.7
1135-1144	11.4	11.5	11.6	11.7	11.8
1145-1154	11.5	11.6	11.7	11.8	11.9
1155-1164	11.6	11.7	11.8	11.9	12.0
1165-1174	11.7	11.8	11.9	12.0	12.1
1175-1184	11.8	11.9	12.0	12.1	12.2
1185-1194	11.9	12.0	12.1	12.2	12.3
1195-1204	12.0	12.1	12.2	12.3	12.4
1205-1214	12.1	12.2	12.3	12.4	12.5
1215-1224	12.2	12.3	12.4	12.5	12.6
1225-1234	12.3	12.4	12.5	12.6	12.7
1235-1244	12.4	12.5	12.6	12.7	12.8
1245-1254	12.5	12.6	12.7	12.8	12.9
1255-1264	12.6	12.7	12.8	12.9	13.0
1265-1274	12.7	12.8	12.9	13.0	13.1
1275-1284	12.8	12.9	13.0	13.1	13.2
1285-1294	12.9	13.0	13.1	13.2	13.3
1295-1304	13.0	13.1	13.2	13.3	13.4
1305-1314	13.1	13.2	13.3	13.4	13.5
1315-1324	13.2	13.3	13.4	13.5	13.6
1325-1334	13.3	13.4	13.5	13.6	13.7
1335-1344	13.4	13.5	13.6	13.7	13.8
1345-1354	13.5	13.6	13.7	13.8	13.9
1355-1364	13.6	13.7	13.8	13.9	14.0
1365-1374	13.7	13.8	13.9	14.0	14.1
1375-1384	13.8	13.9	14.0	14.1	14.2
1385-1394	13.9	14.0	14.1	14.2	14.3
1395-1404	14.0	14.1	14.2	14.3	14.4
1405-1414	14.1	14.2	14.3	14.4	14.5
1415-1424	14.2	14.3	14.4	14.5	14.6
1425-1434	14.3	14.4	14.5	14.6	14.7
1435-1444	14.4	14.5	14.6	14.7	14.8
1445-1454	14.5	14.6	14.7	14.8	14.9
1455-1464	14.6	14.7	14.8	14.9	15.0
1465-1474	14.7	14.8	14.9	15.0	15.1
1475-1484	14.8	14.9	15.0	15.1	15.2
1485-1494	14.9	15.0	15.1	15.2	15.3
1495-1504	15.0	15.1	15.2	15.3	15.4
1505-1514	15.1	15.2	15.3	15.4	15.5
1515-1524	15.2	15.3	15.4	15.5	15.6
1525-1534	15.3	15.4	15.5	15.6	15.7
1535-1544	15.4	15.5	15.6	15.7	15.8
1545-1554	15.5	15.6	15.7	15.8	15.9
1555-1564	15.6	15.7	15.8	15.9	16.0
1565-1574	15.7	15.8	15.9	16.0	16.1
1575-1584	15.8	15.9	16.0	16.1	16.2
1585-1594	15.9	16.0	16.1	16.2	16.3
1595-1604	16.0	16.1	16.2	16.3	16.4
1605-1614	16.1	16.2	16.3	16.4	16.5
1615-1624	16.2	16.3	16.4	16.5	16.6
1625-1634	16.3	16.4	16.5	16.6	16.7
1635-1644	16.4	16.5	16.6	16.7	16.8
1645-1654	16.5	16.6	16.7	16.8	16.9
1655-1664	16.6	16.7	16.8	16.9	17.0
1665-1674	16.7	16.8	16.9	17.0	17.1
1675-1684	16.8	16.9	17.0	17.1	17.2
1685-1694	16.9	17.0	17.1	17.2	17.3
1695-1704	17.0	17.1	17.2	17.3	17.4
1705-1714	17.1	17.2	17.3	17.4	17.5
1715-1724	17.2	17.3	17.4	17.5	17.6
1725-1734	17.3	17.4	17.5	17.6	17.7
1735-1744	17.4	17.5	17.6	17.7	17.8
1745-1754	17.5	17.6	17.7	17.8	17.9
1755-1764	17.6	17.7	17.8	17.9	18.0
1765-1774	17.7	17.8	17.9	18.0	18.1
1775-1784	17.8	17.9	18.0	18.1	18.2
1785-1794	17.9	18.0	18.1	18.2	18.3
1795-1804	18.0	18.1	18.2	18.3	18.4
1805-1814	18.1	18.2	18.3	18.4	18.5
1815-1824	18.2	18.3	18.4	18.5	18.6
1825-1834	18.3	18.4	18.5	18.6	18.7
1835-1844	18.4	18.5	18.6	18.7	18.8
1845-1854	18.5	18.6	18.7	18.8	18.9
1855-1864	18.6	18.7	18.8	18.9	19.0
1865-1874	18.7	18.8	18.9	19.0	19.1
1875-1884	18.8	18.9	19.0	19.1	19.2
1885-1894	18.9	19.0	19.1	19.2	19.3
1895-1904	19.0	19.1	19.2	19.3	19.4
1905-1914	19.1	19.2	19.3	19.4	19.5
1915-1924	19.2	19.3	19.4	19.5	19.6
1925-1934	19.3	19.4	19.5	19.6	19.7
1935-1944	19.4	19.5	19.6	19.7	19.8
1945-1954	19.5	19.6	19.7	19.8	19.9
1955-1964	19.6	19.7	19.8	19.9	20.0
1965-1974	19.7	19.8	19.9	20.0	20.1
1975-1984	19.8	19.9	20.0	20.1	20.2
1985-1994	19.9	20.0	20.1		

TABLE VII

Rheumatic heart disease versus occupation

(ICMR classification 1981)

Occupation	Study Population	Number of cases	Percentage
Student	406	25	6.15%
Unemployed	175	2	1.14%
Housewife	991	-	-
Unskilled	339	7	0.70%
Semi-skilled	916	2	0.22%
Skilled	556	1	0.17%
Clerical	223	3	0.44%
Farmer	327	4	1.20%
Shop Owner	9	-	-
Semi-professional	37	1	2.70%
Professional	10	-	-
Retired	11	-	-
Total	4000 =====	45 =====	

The student community showed a higher prevalence than other occupations i.e. 6.15% (directly related to age factor) of which 4.15% students belonged to Class IV and V which indicate the combined role of social class, exposure to streptococcal infection higher in school children because of close contact.

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This was statistically highly significant in comparison with Benakappe et al wherein 50%, 41%, 6%, 3% were among unskilled, semi-skilled, skilled and semi-professional whereas in the present study, the prevalence rate was 15.56%, 4.45%, 2.22%, 2.22% among the above groups respectively. However, the student population comprised of 55.56% of the cases which indicates the need for intensive health education at school level.

TABLE VIII

Rheumatic heart disease with overcrowding

Overcrowding	Study Population	Population	
		with rheumatic heart disease	without rheumatic heart disease
Yes	2876	40 (1.39%)	2842
No	1124	5 (0.4%)	1113
Total	4000	45	3955
	=====	=====	=====

$$Z = 3.54$$

$$p < 0.001$$

(fig. in parenthesis indicates percentage)

In the present study, rheumatic heart disease prevalence was found to be higher among population showing increased crowding in their families.

The following table shows the results of the survey conducted in the year 1998. The data is presented in the form of a table with the following columns: Name, Age, Sex, and Occupation. The total number of respondents is 100. The data is as follows:

Name	Age	Sex	Occupation
John Doe	25	Male	Teacher
Jane Smith	30	Female	Doctor
Bob Johnson	45	Male	Engineer
Alice Brown	22	Female	Student
Charlie White	55	Male	Retired
Diana Green	35	Female	Manager
Frank Black	60	Male	Farmer
Grace Lee	28	Female	Artist
Henry King	40	Male	Lawyer
Ivy Clark	18	Female	Unemployed

TABLE VIII

Mathematical model for the data set

Mathematical model for the data set		Mathematical model for the data set	
Year	Value	Year	Value
1990	1.2	1995	1.5
1991	1.3	1996	1.6
1992	1.4	1997	1.7
1993	1.5	1998	1.8
1994	1.6	1999	1.9
1995	1.7	2000	2.0
1996	1.8	2001	2.1
1997	1.9	2002	2.2
1998	2.0	2003	2.3
1999	2.1	2004	2.4
2000	2.2	2005	2.5
2001	2.3	2006	2.6
2002	2.4	2007	2.7
2003	2.5	2008	2.8
2004	2.6	2009	2.9
2005	2.7	2010	3.0

$$y = 0.1x + 1.2$$

The following table shows the results of the survey conducted in the year 1998. The data is presented in the form of a table with the following columns: Name, Age, Sex, and Occupation. The total number of respondents is 100. The data is as follows:

Name	Age	Sex	Occupation
John Doe	25	Male	Teacher
Jane Smith	30	Female	Doctor
Bob Johnson	45	Male	Engineer
Alice Brown	22	Female	Student
Charlie White	55	Male	Retired
Diana Green	35	Female	Manager
Frank Black	60	Male	Farmer
Grace Lee	28	Female	Artist
Henry King	40	Male	Lawyer
Ivy Clark	18	Female	Unemployed

The prevalence found being 0.99% higher in population living in overcrowded environment. This difference was found to be statistically highly significant. Gordes-Leon also reported similar findings in their study. Overcrowding increases the exposure to streptococcal infection.

TABLES IX

Rheumatic heart disease and housing conditions

Type of Housing	Study Population	Population with rheumatic heart disease	Percentage of rheumatic heart disease cases
Kutcha	1907	31	1.63%
Semi-pucca	1034	9	0.89%
Pucca	1059	5	0.48%
Total	4000	45	
	=====	=====	

$$\chi^2 = 244.4 ; \quad df = 2 ; \quad p < 0.001$$

Rheumatic heart disease with ventilation

Ventilation	Study Population	Number of cases with rheumatic heart disease	Cases without rheumatic heart disease
Inadequate	2940	39 (1.32%)	2901
Adequate	1060	6 (0.56%)	1054
Total	4000	45	3955
	=====	=====	=====

$$Z = 1.995 ; \quad p < 0.05$$

The following table shows the results of the experiments conducted on the effect of the concentration of the solution on the rate of diffusion of the gas. The results are expressed in terms of the volume of gas diffused per unit time.

Table I

Diffusion of Gas through a Membrane

Concentration of Solution (M)	Volume of Gas Diffused (ml)	Time (min)	Rate of Diffusion (ml/min)
0.1	10.0	100	0.10
0.2	20.0	100	0.20
0.3	30.0	100	0.30
0.4	40.0	100	0.40
0.5	50.0	100	0.50

Table II

Concentration of Solution (M)	Volume of Gas Diffused (ml)	Time (min)	Rate of Diffusion (ml/min)
0.1	10.0	100	0.10
0.2	20.0	100	0.20
0.3	30.0	100	0.30
0.4	40.0	100	0.40
0.5	50.0	100	0.50

Among the total cases, 68.8% live in kutcha houses whereas only 11.1% live in pucca houses (statistically significant). This is mainly due to poor environmental conditions, increased humidity in kutcha houses. Ventilation played an important role in the prevalence of the disease. In this study 39 out of 45 cases were living in houses with inadequate ventilation. This is in accordance with the study done by Strasser et al.

TABLE X

Association of carditis with other major manifestations

Manifestations at first episode	Number of cases	Percentage of rheumatic heart disease cases
Carditis alone	29	64.4%
Carditis + arthritis	9	20.0%
Carditis + chorea	4	8.8%
Carditis + erythema margination	—	0
Carditis + subcutaneous nodules	3	6.67%
Total	45 ====	

In the present study carditis was the prime major manifestation seen in all cases presently prevalent. 20% of the

X 313AT

of candidates with other major manifestations

cases had associated arthritis which emphasizes the importance of the second major manifestation. All the others accounted for less than 16%.

In a study of rheumatic fever and rheumatic heart disease in Baroda children by Saxena 57% had carditis, 42.3% arthritis, 3.8% subcutaneous nodules and only 0.4% had E.M. Hence in rural areas the major manifestation to be stressed on for the diagnosis of rheumatic heart disease are arthritis and carditis.

TABLE XI

Minor manifestations in the diagnosis of rheumatic fever

Manifestations at first episode	Number of cases	Percentage
Fever	44	97.78%
Fever + joint pain	23	51.11%
Fever + sore throat	36	80.00%
Sorethroat	37	82.20%
Joint pain	34	75.50%
Fever + joint pain + sorethroat	19	42.20%
Sorethroat + joint pain	11	24.44%

It was seen that 97.78% of the patients presented with fever while 51.11% and 80.00% had fever associated with joint

cases had associated with the disease the
 the second group, all the cases were
 less than 100.

In a study of 100 cases of rheumatic fever
 in Boston followed by 100 cases of rheumatic fever
 2-10 years after onset, the following results were obtained:
 about 50% of the cases were found to have
 at least one of the following conditions:

TABLE XI
 Minor manifestations in the diagnosis of rheumatic fever

Percentage	Number of cases	Manifestation
50.0%	50	Joint pain
33.3%	33	Joint swelling
33.3%	33	Joint redness
33.3%	33	Joint tenderness
33.3%	33	Joint stiffness
33.3%	33	Joint deformity
33.3%	33	Joint pain on movement
33.3%	33	Joint pain at rest

It was found that the following conditions were
 found in 100 cases of rheumatic fever:

pain and sore throat respectively 82.2%; and 75.5% sorethroat and joint pain as the only minor manifestations. 42.2% had fever, sorethroat as well as joint pains whereas 24.44% had only joint pains and sorethroat. Benakappe et al reported that 74% cases reported with fever, 68% with joint pains and 12% with sorethroat.

TABLE XII (a)

Residual Heart disease - sequelae of rheumatic fever

Residual Heart disease	Number of rheumatic heart disease cases	Percentage of rheumatic heart disease cases
MI	11	24.4%
MS	16	35.5%
MS + MI	7	15.5%
AI	2	4.4%
MS + AI	5	11.1%
MS + MI + AI	3	6.6%
MS + MI + AS + AI	1	2.2%
Total	45 ====	

Mitral stenosis only was found to be the commonest heart lesion detected among those who developed residual heart disease (35.5%) which was maximum. All four valvular lesions viz. A1, AS and M1, MS were seen in only 2.2% of the patients.

with the most common (approximately 50%) of the patients
 having been in the hospital for a long time, while the
 remaining 50% had been in the hospital for a short time.
 The patients were divided into two groups: those who
 had been in the hospital for a long time and those who
 had been in the hospital for a short time. The results
 of the study are shown in the following table.

TABLE II

Residual heart disease - sequelae of rheumatic fever

Number of patients	Number of patients with residual heart disease	Number of patients with sequelae of rheumatic fever
10	5	5
20	10	10
30	15	15
40	20	20
50	25	25
60	30	30
70	35	35
80	40	40
90	45	45
100	50	50

The results of the study show that the number of patients
 with residual heart disease is directly proportional to the
 number of patients with sequelae of rheumatic fever. The
 results of the study are shown in the following table.

Solitary lesion was seen in 64.3% of cases, 2 lesions were seen in 12.6% cases, 3 lesions were seen in 6.2% of cases.

Among farmers in South China 24.1% had isolated mitral stenosis, 13.9% had only mitral incompetence, 34% had both mitral stenosis and/or aortic incompetence and 14.6% had double valvular lesions and 1.2% had others⁽⁹⁰⁾.

TABLE XII (b)

Relation of rheumatic heart disease and secondary prophylaxis

Residual Heart disease	Number of cases	Number of cases of regular secondary prophylaxis
MI	11	9 (81.80%)
MS	16	13 (81.25%)
MS + MI	7	4 (57.14%)
AI	2	1 (50.00%)
MS + MI	5	3 (60.00%)
MS + MI + AI	3	1 (33.30%)
MS + MI + AS + AI	1	-
Total	45 ====	

The patients with 4 lesions had never received secondary prophylaxis. Among those with solitary lesions 79.3% were on

TABLE XII (b)

RELATION OF TERMINAL HEART DISEASE AND SECONDARY PROPHYLAXIS

Terminal heart disease	Secondary prophylaxis	Number of cases	Percentage
1	1	1	100.0%
2	2	2	100.0%
3	3	3	100.0%
4	4	4	100.0%
5	5	5	100.0%
6	6	6	100.0%
7	7	7	100.0%
8	8	8	100.0%
9	9	9	100.0%
10	10	10	100.0%
11	11	11	100.0%
12	12	12	100.0%
13	13	13	100.0%
14	14	14	100.0%
15	15	15	100.0%
16	16	16	100.0%
17	17	17	100.0%
18	18	18	100.0%
19	19	19	100.0%
20	20	20	100.0%
21	21	21	100.0%
22	22	22	100.0%
23	23	23	100.0%
24	24	24	100.0%
25	25	25	100.0%
26	26	26	100.0%
27	27	27	100.0%
28	28	28	100.0%
29	29	29	100.0%
30	30	30	100.0%
31	31	31	100.0%
32	32	32	100.0%
33	33	33	100.0%
34	34	34	100.0%
35	35	35	100.0%
36	36	36	100.0%
37	37	37	100.0%
38	38	38	100.0%
39	39	39	100.0%
40	40	40	100.0%
41	41	41	100.0%
42	42	42	100.0%
43	43	43	100.0%
44	44	44	100.0%
45	45	45	100.0%
46	46	46	100.0%
47	47	47	100.0%
48	48	48	100.0%
49	49	49	100.0%
50	50	50	100.0%
51	51	51	100.0%
52	52	52	100.0%
53	53	53	100.0%
54	54	54	100.0%
55	55	55	100.0%
56	56	56	100.0%
57	57	57	100.0%
58	58	58	100.0%
59	59	59	100.0%
60	60	60	100.0%
61	61	61	100.0%
62	62	62	100.0%
63	63	63	100.0%
64	64	64	100.0%
65	65	65	100.0%
66	66	66	100.0%
67	67	67	100.0%
68	68	68	100.0%
69	69	69	100.0%
70	70	70	100.0%
71	71	71	100.0%
72	72	72	100.0%
73	73	73	100.0%
74	74	74	100.0%
75	75	75	100.0%
76	76	76	100.0%
77	77	77	100.0%
78	78	78	100.0%
79	79	79	100.0%
80	80	80	100.0%
81	81	81	100.0%
82	82	82	100.0%
83	83	83	100.0%
84	84	84	100.0%
85	85	85	100.0%
86	86	86	100.0%
87	87	87	100.0%
88	88	88	100.0%
89	89	89	100.0%
90	90	90	100.0%
91	91	91	100.0%
92	92	92	100.0%
93	93	93	100.0%
94	94	94	100.0%
95	95	95	100.0%
96	96	96	100.0%
97	97	97	100.0%
98	98	98	100.0%
99	99	99	100.0%
100	100	100	100.0%

Source: Data from the National Heart, Lung, and Blood Institute, National Institutes of Health, Bethesda, Maryland, 1960.

Notes: 1. The data are based on the results of the National Heart, Lung, and Blood Institute, National Institutes of Health, Bethesda, Maryland, 1960.

regular secondary prophylaxis and of those with 2 lesions 58.3% were on regular chemoprophylaxis.

The above data stresses the importance of secondary chemoprophylaxis to prevent progression of valvular lesions.

In a study done by Tompheins, mitral stenosis did not develop in any patient known to have received intramuscular penicillin prophylaxis without fail⁽⁷⁷⁾.

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SUMMARY

The present study was carried out in a rural area catered by the Rural Health cum Training Centre, Mandur, a 20-bedded hospital, and its subcentres covering an area of 78.2 sq.km and a population of 40,000, from March 1994 to August 1994 to study the prevalence of rheumatic fever and rheumatic heart disease and the social factors associated with rheumatic heart disease and to administer secondary penicillin prophylaxis in the area. Finally to recommend preventive and control measures so that rheumatic fever/rheumatic heart disease ceases to be a public health problem in the near future.

The sample population of 4000 was selected consisting of 10 percent of the total population. It was a cross sectional study.

The following is the summary of the results obtained.

6.1 The overall prevalence of rheumatic heart disease in this rural study population was found to be 1.2%. The highest prevalence of 3.75% was seen in the 20-24 year age group followed by the 10-14 age group with a percentage of 1.66%.

6.2 Higher prevalence was found in females (1.25%) as compared to males (0.98%) giving a male to female ratio of 1:1.3 in the respective population.

6.3 The impact of religion as a variable in the distribution of rheumatic heart disease was seen. Higher prevalence was found among Hindus (1.23%) and in Christians it was 0.58%. There was no significant association of the presence of rheumatic heart disease with religion.

6.4 Literacy played a major role in the prevalence of rheumatic heart disease. Among the children of illiterate parents the prevalence was 1.92% whereas among the children whose parent/s were literate it was 0.88%. There was a strong association between the prevalence of rheumatic heart disease and parental literacy.

6.5 Rheumatic heart disease was found to be most prevalent among population showing increasing crowding in their families. The prevalence was 1.39% in those showing crowding while it was 0.4% in those not showing overcrowding.

6.6 Impact of variables like housing, when considered showed a high prevalence 68.8% among kutcha house dwellers as compared to pucca house dwellers.

6.7 Inadequate ventilation was found to be an important factor in the increased prevalence of rheumatic heart disease. Prevalence was higher in those with inadequate ventilation (1.32%) compared to those with adequate ventilation which was 0.56%.

1. The first part of the report is devoted to a general survey of the situation in the country. It is a very interesting and useful survey, and it is well worth reading. It is a very good example of the kind of work that can be done by a small group of people.

2. The second part of the report is devoted to a detailed study of the situation in the country. It is a very interesting and useful study, and it is well worth reading. It is a very good example of the kind of work that can be done by a small group of people.

3. The third part of the report is devoted to a detailed study of the situation in the country. It is a very interesting and useful study, and it is well worth reading. It is a very good example of the kind of work that can be done by a small group of people.

4. The fourth part of the report is devoted to a detailed study of the situation in the country. It is a very interesting and useful study, and it is well worth reading. It is a very good example of the kind of work that can be done by a small group of people.

5. The fifth part of the report is devoted to a detailed study of the situation in the country. It is a very interesting and useful study, and it is well worth reading. It is a very good example of the kind of work that can be done by a small group of people.

6.8 Majority of the patients presented with carditis alone followed by these having carditis along with arthritis 20% carditis and chorea (8.8%) and carditis and subcutaneous nodules (6.67%). No patient was detected having carditis and erythema marginatum.

6.9 High prevalence was noted in the population belonging to the economically backward community. The prevalence went on increasing from social class I - V. The prevalence being 0 in class I, 0.87% in II, 0.98% in III, 1.10% in IV and 4.14% in V.

6.10 The prevalence of rheumatic heart disease was most common among the student population (6.15%) while it was nil among the professionals, the retired and housewives. Among the unemployed it was 1.14%, unskilled 0.7% and skilled 0.44%.

6.11 Among the minor manifestations, 97.18% of the patients were presented with fever, whereas fever with associated joint pain was seen in 51.11% of cases, fever with sorethroat in 80%. 80% were presented with only sorethroat, 82.2% with jointpain and 75.5% presented with fever, sorethroat and jointpains and 42.2% with sorethroat and jointpains. Past rheumatic fever could be obtained from all the cases.

6.12 Mitral stenosis was found to be the commonest heart lesion (35.59) detected among those who developed residual heart

6.6. The results of the analysis presented with Table 1 show that the mean values of the parameters of the distribution of the number of cases are not significantly different from the values obtained in the analysis of the data of the other years. The results of the analysis of the data of the other years are presented in Table 2.

6.7. The results of the analysis of the data of the other years are presented in Table 2. The results of the analysis of the data of the other years are presented in Table 2.

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6.10. The results of the analysis of the data of the other years are presented in Table 2. The results of the analysis of the data of the other years are presented in Table 2.

disease, complication of mitral stenosis along with mitral incompetence, aortic stenosis and aortic incompetence was noted in only 2.2% of the patients.

It was seen that patients with 4 lesions had never received secondary prophylaxis. 79.3% of the cases with solitary lesion were on regular secondary prophylaxis while only 58.3% of those with 2 lesions and 33.3% of those with 3 heart lesions were in regular secondary prophylaxis.

6.13 Most of the cases which were first diagnosed were in the age range of 10-14 years (55.5%) followed by those in the age group 5-9 years (37.7%). Only 66% of the cases were first diagnosed in the 15-19 year age group.

Hence in the initiation of prevention and control measures, emphasis is to be laid in public health education in the early detection and treatment of sorethroat to prevent the occurrence of rheumatic fever & thereby rheumatic heart disease.

RECOMMENDATIONS

7.1 Rheumatic fever/rheumatic heart disease continues to be a public health problem in the developing world causing mortality and morbidity both among children and adults. Although little longitudinal data is available, evidence suggests that there has been little, if any, decline in the occurrence of rheumatic heart disease over the past few decades.

Though guidelines for the control of rheumatic fever/rheumatic heart disease have been laid down by WHO and other bodies, its control has been largely neglected because of the health priorities in many countries. The high cost and poor facilities for cardiac surgery provides strong justification for prevention.

The major intervention for prevention and control include reduction of exposure to Group A streptococci. Streptococcal research will help not only in improving the quality of primary prevention of rheumatic fever but also in developing streptococcal vaccines.

7.2 Since the prevalence of rheumatic heart disease in the present study is 1.12%, this population definitely requires some preventive measures to reduce this problem.

DISCUSSION

The first of the two main points to be considered is the question of the validity of the results obtained from the analysis of the data. It is clear that the results obtained from the analysis of the data are in good agreement with the results obtained from the analysis of the data. This is a very important point to be considered, as it shows that the results obtained from the analysis of the data are reliable and can be used for the purpose of the study.

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The third of the two main points to be considered is the question of the validity of the results obtained from the analysis of the data. It is clear that the results obtained from the analysis of the data are in good agreement with the results obtained from the analysis of the data. This is a very important point to be considered, as it shows that the results obtained from the analysis of the data are reliable and can be used for the purpose of the study.

The fourth of the two main points to be considered is the question of the validity of the results obtained from the analysis of the data. It is clear that the results obtained from the analysis of the data are in good agreement with the results obtained from the analysis of the data. This is a very important point to be considered, as it shows that the results obtained from the analysis of the data are reliable and can be used for the purpose of the study.

7.3 The decrease of rheumatic fever can be achieved by improved socio-economic conditions, elimination of overcrowding, development of physical barriers to the spread of streptococci and improved nutrition.

7.4 The first attack of rheumatic fever can be prevented through very large treatment coverage of streptococcal infection even though only 0.3% - 3% will result in rheumatic fever, primary prophylaxis to prevent initial attack of rheumatic fever. It is seen that the prevalence of rheumatic fever increases the need for early detection and treatment of streptococcal pharyngitis. Sorethroat, in the majority of cases is of viral origin. However 10 - 20% cases are caused by streptococci and 1% - 3% are associated with rheumatic fever. Hence surveillance of school children, treatment of pharyngitis ideally with one injection of Benzathine penicillin (1.2 million units) for adults and 6 lakhs for children is to be carried out as it is least expensive, least allergenic with maximum compliance. All this must be integrated into the primary health care system.

7.5 Surveillance of known cases of rheumatic heart disease and rheumatic fever in a community and regular penicillin prophylaxis in order to prevent relapse and deterioration is important.

The percentage of patients with rheumatic heart disease was higher in those with low literacy levels, lower social

2.2 The purpose of this study is to investigate the effect of the independent variable on the dependent variable. The study is designed to test the following hypotheses:

2.3 The first hypothesis is that there is a positive relationship between the independent variable and the dependent variable. The second hypothesis is that there is a negative relationship between the independent variable and the dependent variable. The third hypothesis is that there is no relationship between the independent variable and the dependent variable. The fourth hypothesis is that there is a non-linear relationship between the independent variable and the dependent variable. The fifth hypothesis is that there is a moderating effect of the independent variable on the relationship between the independent variable and the dependent variable. The sixth hypothesis is that there is a mediating effect of the independent variable on the relationship between the independent variable and the dependent variable. The seventh hypothesis is that there is a moderating effect of the independent variable on the mediating effect of the independent variable on the relationship between the independent variable and the dependent variable. The eighth hypothesis is that there is a mediating effect of the independent variable on the moderating effect of the independent variable on the relationship between the independent variable and the dependent variable. The ninth hypothesis is that there is a moderating effect of the independent variable on the mediating effect of the independent variable on the moderating effect of the independent variable on the relationship between the independent variable and the dependent variable. The tenth hypothesis is that there is a mediating effect of the independent variable on the moderating effect of the independent variable on the mediating effect of the independent variable on the relationship between the independent variable and the dependent variable.

2.4 The study is designed to test the following hypotheses:

The study is designed to test the following hypotheses:

classes, the student community, hence health education should form the mainstay of a Prevention and Control programme.

Here the role of parents, teachers and primary health care workers is emphasized in detecting sorethroat and rheumatic fever cases and the continuation of secondary prophylaxis. Rheumatic fever clinics are essential to increase compliance.

7.6 Health educational activities should be organised for parents - specially the mother, patients, their relatives and the general public. Broadcasting, educational programmes on radio, television, etc., use of pamphlets, brochures and posters, newspaper articles - these activities are to be conducted by doctors, nurses and other trained personnel.

7.7 Primary care physicians have a key position in the prevention and care of rheumatic heart disease because of the close contact with patients and their families. Their knowledge should be updated by workshops or seminars organised by teaching institutions.

The principles of rheumatic fever are often taught poorly in many medical schools. One reason is that the entire field of preventive medicine is often under-represented in the curriculum. This situation should be corrected mainly through the teaching of streptococcal microbiology in a clinical context by departments

of pediatrics, cardiology and community medicine, school health services, etc. Nurses should also be motivated to play a significant role.

7.8 Role of auxilliary personnel should be (1) health education in acute rheumatic fever (2) secondary prophylaxis which consists of giving (1.2) million units of Benzathine penicillin for adults and 6 lakh units for children (3) Examination of 5 - 15 year olds with suggestive acute infections (4) search for contacts with symptoms.

7.9 Stress should be laid on the preventive aspects of rheumatic heart disease in the curriculum of preventive medicine in medical schools. It should include knowledge about the socio-cultural factors and preventive aspects and socio-economic consequences of life-long cardiac disability.

7.10 The ultimate aim should be to incorporate screening surveys into the routine school health examination system since the prime target consists of children aged between 5 and 16 years. The facilities used for prevention would mainly be those of the services of primary health care, school medicine and maternal and child health care. For screening, the facilities of hospital departments and the help of trained nurses would be necessary.

There should be a natural assessment of the risk involved, its financial toll and the effects on children.

Evaluation of programmes by periodic surveys, of random samples of school children is the best indicator which has to be followed.

Since student community i.e. age group 5 - 15 years, is most involved, surveillance to identify the epidemiological pattern in the community and to monitor streptococcal infection is important. Two or three surveys (which include clinical, bacteriological and serological examination) covering the principle seasons of the year are desirable. The surveillance should be the responsibility of the national rheumatic fever control programme. The criteria which are well documented for identification of the condition should be brought to the attention of parents, teachers and auxiliary health workers.

7.11 Laboratory facilities for both culture and serology should be available, but because these services are poor in developing countries, the clinical suspicion remains the main platform on which further action should be taken.

7.12 A school health registry should be maintained, the objective of which would be to characterise rheumatic fever and rheumatic heart disease cases, to determine the effectiveness of

the present modalities of prophylaxis and to determine reasons for non-adherence to the prophylactic regimen.

A rheumatic fever registry is to be maintained for effective follow-up of rheumatic fever patients. This registry should:

- i) have a record of all rheumatic fever patients receiving continued prophylaxis,
- ii) maintain a list of patients due for prophylaxis each month,
- iii) should also contain a list of patients who should continue prophylaxis but failed to have their prescription filled.

The poverty-disease poverty circle should be attacked from both directions.

7.13 A national rheumatic fever/rheumatic heart disease control programme should be started.

1) The health authorities must be persuaded about the need for and feasibility of rheumatic fever control. For this, support of voluntary organisations, local opinion leaders and health professionals is necessary since rheumatic disease has serious consequences for the national health systems and social services existing. Community planning and social services have to take account of the high incidence of disabilities suffered by the patient. Assistance can be given to the patient in areas of

transport, housing, ergonomics, sheltered workshops, supply of work rehabilitation or retraining.

Mobile physiotherapy units, occupational guidance and self-help devices will prove useful.

The assignment of appropriate priority to the control of rheumatic fever should originate not only from the understanding of epidemiology but also taken into account the socio-economic growth of developing countries and be considered within the concept of integration of health care activities in a multipurpose health care delivery system.

Finally, a fully established control programme should operate a central register for patients with rheumatic fever and rheumatic heart disease -

- (1) to promote cooperation between participating physicians, school health services, MCH centres, hospitals and laboratories.
- (2) to establish and maintain a system of regular secondary prophylaxis.
- (3) promote health education and keep health personnel at all levels informed about rheumatic fever and rheumatic heart disease in general and the programme in particular.



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P R O F O R M A

The Prevalence of Rheumatic Heart Disease in a Rural Population
Catered by Rural Health cum Training Centre, Mandur and
Administration of the Secondary Prophylaxis.

Family Schedule:

Name of the patient _____ A/S/ _____
Village : _____ House No. _____
Father's name : _____ Mother's name : _____
Literacy states of Father _____ Literacy states of mother _____
Religion : _____ Hindu/Muslim/Christian/Others _____
Type of Family: Joint/Nuclear _____
Source of Income: Father's income : _____
Mother's income : _____
Total income : _____
Social classification : I / II / III / IV / V
(Revised B.G. PRASAD'S classification)
Environmental Sanitation : Hygienic/Unhygienic _____
Locality of house: Kutcha/Semi-kutcha/Pucca _____
No. of living rooms: _____
Overcrowding: Present/Absent _____
Ventilation: Adequate/Inadequate _____
Water supply: Hard pump/Sanitary well/Open shallow well _____
Whether using Boiled/Chlorinated water _____
Excreta disposal Sanitary/Insanitary (Specify) _____
H/o any illness in the family. _____

II Individual Schedule: (Pertaining to RHD)

(a) Did you suffer from any one or more of the following:

Yes/No _____

Duration	R_x given
----------	-------------

1. Dyspnoea/or Orthopnoea
2. Palpitations
3. Cyanosis
4. Cedema of feet
5. Chest pain
6. Recurrent sore throat
7. Recurrent infection (Respiratory)
8. Urinary tract infection
9. Dry cough
10. Any abnormal movements (Chorea)
11. Difficulty in swallowing
12. Hoarseness of voice

(c) Were the above symptoms followed by:

a) Fever : type (specify) _____

b) Pain & swelling & redness of knee/ankle or any other joint:

Yes/No _____

c) Did you ever cough blood: Yes/No _____

d) Were you receiving penicillin injections every month _____

e) Are you aware that sore throat can lead to heart disease

Yes/No _____

Physical Examination:

Ht in cm _____

Wt in kg _____

General Examination:

Pallor : present/absent _____

Throat congestion present/absent _____

Nails: Clubbing/cyanosis present/absent _____

Pulse: Rate/rhythm/volume/arterial wall _____

Temp: _____

Bp: _____

Rash: Present/absent (specify) _____

Swelling of feet: present/absent _____

Neck vein: present/absent _____

Apex beat Normal/abnormal _____

 site of apex beat _____

Physical Description

100-100000

100-100000

Physical Description

100-100000

100-100000

100-100000

100-100000

100

100

100-100000

100-100000

100-100000

100-100000

100-100000

Heart sound Normal/abnormal _____

area _____

Murmur Specify type _____

character _____

RS: abnormal breath sounds _____

(crepts., rhonchi) _____

P/A: Liver: palpable/Non-palpable _____

Spleen: palpable/Non-palpable _____

Clinical diagnosis: _____

III Clinical Investigations:

Hb in gm % _____

ECG findings _____

ASO titre _____

C-Reactive Protein _____



